

## Spare the Cash and Spoil the Business



Money pinched from advertising and selling appropriations is not money saved, but simply the sale of a portion of the firm's good will

by Fritz J. Frank

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OBVIOUSLY the most important duty confronting the management of any business is to take such steps as will insure the continued existence of the business.

Yet today in practically every field we see businesses managed as if they were to be liquidated within a few months. I refer particularly to unwise and excessive conversion of assets into cash. Maintenance of a strong cash position is a mark of good management, but like other virtues, it becomes a vice if carried to extremes.

Abandonment of advertising and slashing of sales forces are simply a matter of converting good will into cash, an admirable procedure if a company is to be liquidated, but highly dangerous if the business is to be kept operating as a going concern.

Unfortunately for the safety of the business they manage, some men have the mistaken idea that their customers and prospects hibernate mentally during a depression. They feel that when business is bad there is a temporary repeal of the law that people will forget that which is not kept constantly before them.

**"Investors will properly beware of a company that is making big 'savings' by failing to do that which will insure its continued existence"**

And there, I believe, is the reason why every depression raises such havoc among established leaders and inscribes so many new names on the rolls of the mighty. Some big fellows become complacent. "No one is buying now," they say. "Let us cut down on our advertising, fire our salesmen, and coast a while. Plenty of time to get back into the running when things pick up."

But getting back into the running is so difficult, so expensive, and oftentimes downright impossible. Set this down as an absolute truth:

*No firm can withdraw from active participation in a given field, and, after hibernating until the upturn begins, enter the field again with good will undamaged, and its memory still bright in the minds of its former customers and prospects.*

People forget. New impressions quickly crowd out old impressions. It is far less costly to maintain a position in a given field than the regain it. I wonder if it is not true that it is even more essential for business to maintain close contact with its customers in periods of depression than in flush times. When buying is frequent the mere act of placing orders keeps the product in the buyer's mind.

But when the order book gathers dust the buyer tends to forget his former supply source, and unless continually reminded by advertising, either printed or word of mouth, he is likely to make a change when he reenters the market.

A business cannot stand still. The only way a strong cash position can be kept strong, if no money

is spent for promotion, research and product improvement, is to give up the business. Otherwise, taxes, salaries, maintenance, etc., will steadily nibble away the cash, resulting in slow business suicide. And, as history shows, not really so slow at that.

The directors of the Colgate-Palmolive-Peet Co. must have realized the truth of that when they recently decided to reduce the common dividend rather than reduce advertising. I do not know whether C-P-P carries its good will on its financial statement at one dollar or one million dollars, but in either event not even the neediest stockholder can deny that the directors acted wisely.

Why make a fictitious "saving" of a dollar now and sacrifice ten or twenty dollars of future earnings? Despite what accountants say, C-P-P advertising expenditures are more truly a capital asset than the very bricks in the Colgate plant in Jersey City. Plants can be bought for a song, but the reputation of the product, created largely by advertising, is the business.

Money pinched from advertising and selling appropriations is not money saved, but simply the sale of a portion of a firm's good will. To put it another way, it is a matter of borrowing, at a usurious interest rate, on future earnings.

Investors will properly beware of the company that is making big "savings" by failing to do that which will insure its continued existence. In my opinion it does not take courage to advertise now—it is simply a matter of common sense.

**"People forget. . . . And there is the reason why every depression raises such havoc among established leaders and inscribes so many new names on the rolls of the mighty"**

## Built-Up Crankshaft in Saurer Diesel Truck

THE latest design of Diesel truck engine of the Adolphe Saurer Company of Arbon, Switzerland, has a built-up crankshaft, each crank unit consisting of a crankpin and halves of the two adjacent crank cheeks, which are cylindrical. The two halves of each crank cheek are held together by three bolts and nuts.

A cylindrical roller bearing with a bore somewhat greater than the piston stroke surrounds each crank cheek. Crankpin and piston-pin bearings are of the usual types. This engine is made in several sizes. A small four-cylinder engine, for instance, has 100 by

130 mm. cylinder dimensions and delivers 55 hp. at 2400 r.p.m., while a larger engine has 130 by 180 mm. bore and stroke.

Provisions are made for varying the beginning of injection by hand between 11 and 27 deg. advance, according to the speed of the engine. The compression ratio is 15.5, the maximum compression pressure 380 to 440 lb. p. sq. in., and the maximum combustion pressure 530 to 560 lb. p. sq. in. The cylinders have dry liners of special gray iron only 0.080 in. thick. Engines operate on the Arco air-chamber principle.

# JUST AMONG OURSELVES

## "If I Were Out of a Job"

JUST got a real kick out of a little book by G. P. Blackiston called, "If I Were Out of a Job." If I were out of a job I'd read it over again at once and profit from its specific suggestions as well as from its inspirational quality.

Written just a mite too self-confidently, its chief messages to the jobless are: (1) It is up to you to suggest how you can be of value to the one you approach; (2) keep working all the time on the job of thinking up things to suggest to people that they need done and which you can do for them.

Besides generalities, some of which, it must be admitted, verge on the teachings of the Horatio Alger school, the author provides a large number of very specific suggestions for people with very different talents.

A series of 10 to 15 definite suggestions follow under each of such headings as "If I were a man with no outstanding qualifications"; "If I knew flowers and plants"; "If I had sales ability"; "If I were a really keen buyer"; "If I could drive a car"; "If I could teach"; "If I knew books"; "If I had advertising experience," etc.

The cynical will be better impressed with the book after they pass page 10 than they were up to that point, although on page 9 appear the following two paragraphs which seem to us to be the essence of sound advice to an unemployed man under current depression conditions:

"It is up to you to suggest how you can be of value to the one you approach—suggest work he should have done, show him how he would save by having you do it for him, etc.

"In other words, sell yourself—talk from his or her viewpoint or gain—not from yours. Few are really interested impersonally in you or me, except from the standpoint of pity or charity. But they are interested today more than ever in how they can save a penny, and just what you can do for them, not they for you. If you contribute to new opportunities of profit or of saving, they will seek you. You will not have to hunt them very long."

## Wild Life at Packard Proving Ground

WILD life on the Packard proving ground has brought forth some real problems for drivers, engineers, and others of the proving ground staff, Charlie Vincent, proving ground manager, says.

The airplane landing field inside of the 2½-mile concrete speedway is overrun with badgers. These little animals have just moved in and taken possession. The dens they burrow down into the ground are interfering with the operation of planes in and out of the field.

Badgers are protected by Michigan game laws, and besides, says Vincent, there is no appropriation for killing badgers. However, badgers, which are savage but canny little beasts, have learned to keep off the speedway.

Badgers and skunks are both nocturnal animals; but, whereas the badgers stay around home at night, skunks wander about on lengthy expeditions. Frequently in the lordly sort of manner they have acquired toward all moving things, they try to dispute the right-of-way with automobiles traveling at 90 m.p.h. or more on the big oval track. Results have always proved disastrous to the skunks. Vincent believes perhaps the badgers have observed this. At any rate no badger has yet been encountered by any of the night-driven cars.

Chinese and California ring-neck pheasants formerly were a serious problem at the Packard proving ground. When the speedway was built one side of it cut across what formerly had been a swamp. This swamp had been the home of large numbers of pheasants. The birds, according to Louie Webber, chief test driver, couldn't seem to get through their silly heads the fact that the swamp had been filled up. Creatures of habit, they stayed in the same locality. Often birds hurtling across the track would crash into cars traveling at top speed.

Webber has observed now, however, that the pheasants have migrated into the rough ground section of the great 500-acre proving ground tract.

## We are Wrong, it Seems—But How?

"DEAR MR. EDITOR," writes H. J., whose initials we don't recognize offhand: "Re: 'Just Among Ourselves,' July 30, 'Cooling Sales No Automotive Problem': Ah, ah, you didn't catch on. That 'Sales Cooler Upstairs' was not meant the way you interpret it and I am sorry to say the cooling problem is still with us automotive men; if not in the sales end of it, surely in the engineering. Advise the boys to work on it."—N.G.S.



# Variation of Thermal Efficiency With

by P. M. Heldt

It is sometimes desirable to know the thermal efficiencies of an automobile engine under different conditions of operation, that is, at various speeds and torque loads. Unfortunately, very little experimental data are extant regarding the specific fuel consumption of automobile engines at part throttle over the whole speed range.

Considerable data of this general character have been published regarding tractor engines by the Engineering Department of the University of Nebraska, but practically all tractor engines are governed, and the maximum speeds at which they are operated do not correspond to the peaks of their horsepower curves. One has no means of knowing the relation of the governed speed to the peaking speed of these engines, and it is therefore impossible to generalize these data until facts are available.

Having had a request recently for information on the variation of the thermal efficiency of automobile engines with speed and torque, the writer gathered some of the data available on the subject and prepared the accompanying charts, which show the approximate variations with speed and torque of the mechanical efficiency, the brake thermal efficiency, and the thermal efficiency.

It is not pretended that these curves enable one to foretell accurately the efficiencies obtainable from any particular engine, since features of design and workmanship have their effects, but it is believed that the charts give a good idea of the efficiencies actually obtained from modern well-designed passenger-car engines under normal operating conditions.

"Normal operating conditions" in particular involves a carburetor setting which is satisfactory from both the fuel consumption and the power standpoints, as distinguished from one aiming exclusively at high fuel economy.

In order that the charts may be of the widest possible applicability, the scales are arranged on

Curves show approximate variations with speed and torque of mechanical brake - thermal and thermal efficiency of automotive powerplant under normal operating conditions

a percentage basis, 100 per cent on the speed scale representing the speed at which the engine develops its maximum horsepower under full throttle (the

peaking speed), while 100 per cent on the torque scale represents the torque developed by the engine under full throttle at any particular speed.

In the preparation of the curves the first step taken was to get a representative specific fuel-consumption curve for full-throttle operation. This was obtained by making a composite of the fuel-consumption curves of five different engines.

Calling the specific fuel consumption of each engine at its peaking speed 100 per cent, the specific consumptions of the engines, in per cent of the "power-peak" specific consumption, was determined for 75 per cent, 50 per cent and 25 per cent of the peaking speeds. The figures thus arrived at

were averaged by taking the arithmetic means, and with the aid of these figures the "representative specific fuel consumption curve" was drawn.

Next the specific fuel consumption of the engine at peak load was assumed to be 0.65 lb. p. b. hp.-hr. This figure may seem somewhat low for a modern high-compression engine, but it is intended to be an actual service figure and not a demonstration figure.

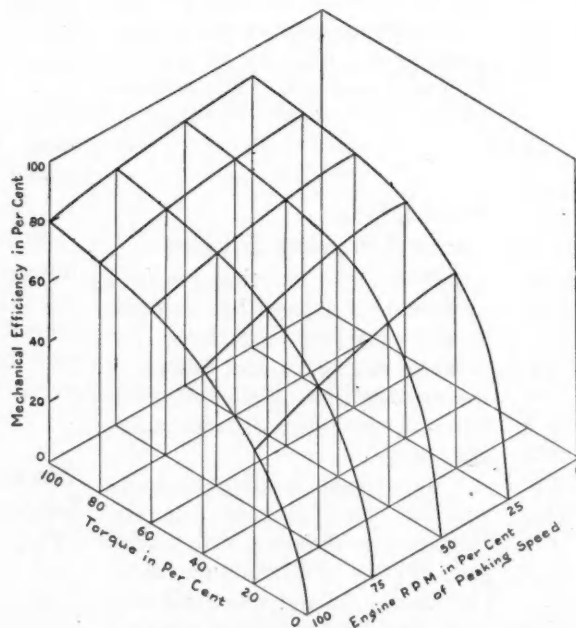


Fig. 1—Variation of mechanical efficiency with speed and torque load



# Speed and Torque Determined

There are a number of ways of improving the performance of an engine on the test stand, from the fuel-economy standpoint, which are not applicable on a road vehicle, such as the use of a very lean mixture, and it is believed that 0.65 lb. p. b. hp.-hr. at maximum horsepower is a good field performance. The fuel economy is bettered as the speed is decreased, the throttle remaining wide open.

Having set the specific fuel consumption for the peaking point of the horsepower curve, our representative specific fuel consumption curve, which has a percentage scale, immediately gives the specific fuel consumptions for different speeds of full throttle operation.

From the specific fuel consumption it is quite easy to determine the brake thermal efficiency if the heat value of the fuel is known. The lower heat value of all gasolines is close to 19,000 B.t.u. per pound. One horsepower-hour corresponds to

$$33,000 \times 60 = 1,980,000 \text{ ft.-lb.}$$

and the mechanical equivalent of the heat in one pound of gasoline is

$$19,000 \times 778 = 14,782,000 \text{ ft.-lb.}$$

Therefore, if the engine consumes  $x$  lb. of fuel per brake horsepower-hour, its thermal efficiency is

$$\frac{1,980,000 \times 100}{14,782,000 x}$$

$$\text{or } \frac{13.38}{x} \text{ per cent.}$$

To obtain specific consumption figures for part-throttle operation is the most difficult part of the work, for, as pointed out, comparatively few figures have been published on the consumption of fuel throughout the speed and torque range of passenger-car type engines. Such a general survey of the entire field of operation was made by Herbert Chase on a six-cylinder Pierce-Arrow engine a good many years ago, and although this was a T-head engine and differed from modern passenger car engines in other respects, this seems to be the only record of research work of this kind available.

The only purpose for which this data was used was to determine the ratios between the specific

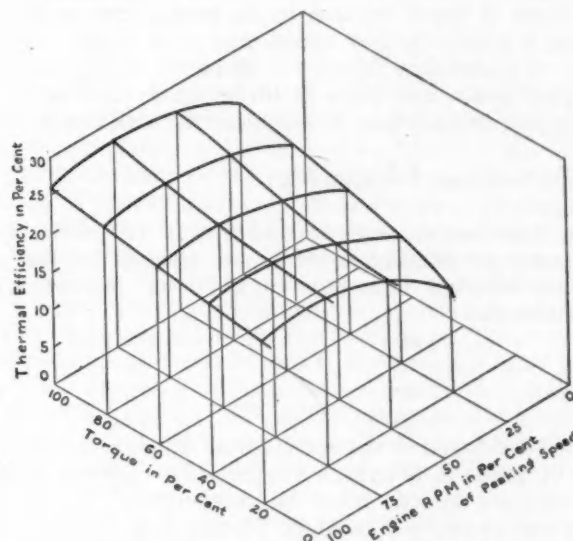


Fig. 2—Variation of brake-thermal efficiency with speed and torque load

fuel consumptions at full throttle at different speeds and at part throttle at the same speeds, definite fractions of the maximum torque at any particular speed being chosen for the points of part-throttle fuel consumption determination.

Thus the fact that this engine, because of its relatively low compression ratio, consumed more fuel per horsepower-hour than our modern engines does not affect the results.

Undoubtedly the most uncertain efficiency in internal combustion engines is the mechanical efficiency, which depends upon the proportions of parts, the workmanship and the lubricants employed. The mechanical efficiency is usually determined by "motoring" the engine by means of an electric dynamometer, measuring the friction horsepower absorbed at different speeds, and assuming that the frictional losses are the same when the engine is being run under load at the same speeds.

The mechanical efficiency of a well-built engine usually is approximately 80 per cent under peak horsepower load. The exact figure depends not only on the design of the engine, the accuracy with which its bearings are fitted, and the characteristics of

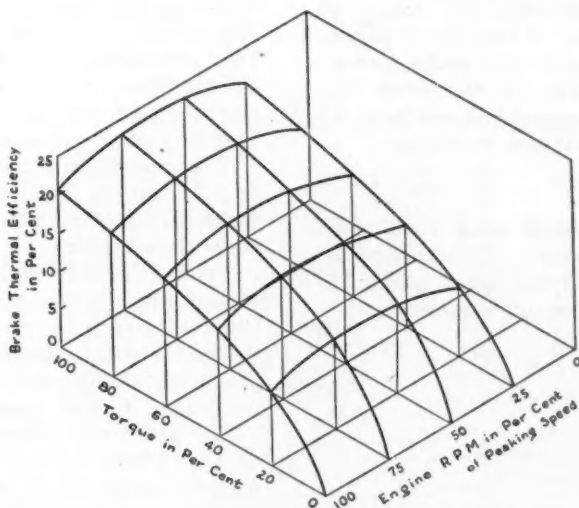


Fig. 3—Variation of thermal efficiency with speed and torque load

the lubricant used, but also upon the number of accessories driven by the engine when the test is made.

This figure cannot vary greatly, because the peaking speed is determined to a considerable extent by the friction loss. If an engine is so designed that there is much friction in its parts, then it will peak at a relatively low speed, and vice versa.

A good many friction horsepower curves have been published, and there is therefore no lack of data as to the variation of friction losses with engine speed.

### Determines Friction Hp.

From such curves we find that if the friction horsepower at peaking speed is set down at 100 per cent, the friction horsepowers at other speeds are as follows:

Speed	Friction Hp.
75	62
50	33.5
25	12.5

To determine the mechanical efficiencies at different loads and speeds the relative outputs at these different speeds must be determined. To this end a torque curve is needed. Here, again, use was made of a composite curve representing an average of a number of actual torque curves. Calling the full-throttle torque at peaking speed 100 per cent, we get

Speed	Full-Throttle Torque
75	119.5
50	125.3
25	117

To determine the mechanical efficiency for any point of the field we proceed as follows: Taking 75 per cent speed and 50 per cent torque, for instance, let us denote the indicated power when the engine is running under peak load by  $\chi$ . Then the mechanical losses are equal to  $0.2\chi$  and the brake horsepower is equal to  $0.8\chi$ . Now we see from the above table that at 75 per cent speed the mechanical losses are 0.62 times as great and are therefore

$$0.62 \times 0.2\chi = 0.124\chi$$

The maximum torque at this speed being 1.195 that at the peaking speed, 50 per cent of this torque is 0.597 that of peaking speed, and the speed being 75 per cent peaking speed, the brake horsepower is

$$0.597 \times 0.75 \times 0.8\chi = 0.358\chi$$

and the mechanical efficiency therefore is

$$\frac{0.358\chi}{0.358\chi + 0.124\chi} = 74.3 \text{ per cent}$$

Mechanical efficiencies for other proportional speeds and fractional torques were calculated in the same way, and the results are plotted in Fig. 1.

As stated previously, the relation between the spe-

cific fuel consumption at peak horsepower output and that at any particular fraction of the peaking speed and any fraction of the maximum torque at that speed was obtained from the test of the six-cylinder Pierce-Arrow engine. This gave a set of values from which the chart Fig. 2 for the brake thermal efficiency was obtained. Finally, we obtain the thermal efficiency for any point of the operating field by dividing the brake thermal efficiency for that point by the mechanical efficiency. The thermal efficiencies are plotted in Fig. 3.

We see from these charts that the mechanical efficiency of the engine increases as the torque load increases but decreases as the speed increases. Owing to the fact that the engine can be run at lower speeds at part throttle than at full throttle, it is likely that the absolute maximum mechanical efficiency corresponds to a torque slightly less than the maximum, and to the lowest speed at which the engine will run satisfactorily under this torque.

### Efficiency Varies With Speed

That the mechanical efficiency must vary inversely as the speed is obvious from the fact that over that portion of the horsepower curve at which the engine can be worked practically, the available horsepower increases less rapidly than the speed, whereas the friction horsepower increases more rapidly than the speed. Engine torque curves often show the torque to decrease with the speed over a certain range of the latter, but the engine cannot be worked in this range, for the reason that the slightest increase in the torque load would stall it.

The brake thermal efficiency, which from a practical standpoint is the most important factor, increases continuously with the torque and increases with the speed up to a certain point depending upon the torque, and then decreases as the speed is further increased. The brake thermal efficiency attains its maximum value at between 60 per cent and 65 per cent of the peaking speed, the percentage increasing as the torque load decreases.

The maximum brake thermal efficiency, of course, is affected by both the thermal efficiency and the mechanical efficiency, being, in fact, the product of these two factors.

From Fig. 3 it will be seen that the thermal efficiency, that is, the proportion of the heat energy of the fuel which is converted into mechanical energy, increases continuously with the torque, while it increases with the speed up to a certain point and then decreases as the speed increases further.

The point on the speed scale at which the thermal efficiency reaches its maximum value varies with the torque, being about 87 per cent peaking speed for 25 per cent maximum torque; 82 per cent peaking speed for 50 per cent maximum torque; 75 per cent peaking speed for 75 per cent maximum torque, and 70 per cent peaking speed for full torque.

**B**RIGGS & STRATTON CORP., Milwaukee, has just released for general sale a new air valve originally developed several years ago for its own plant purposes, and for the past year used experimentally in a large number of shops in various parts of the United States.

The valve supplies automatic, intermittent control of compressed air blasts for ejecting work, keeping dies and tools clean.

It is used on punch presses and other machine tools

where drilling, broaching, reaming and similar operations require controlled compressed air blasts to save tools, increase efficiency, permit greater accuracy and higher production speeds. Precision-built, the valve, seat and spring are of corrosion-resistant steel. The air inlet bushing is of brass.

An extra long guide is lined with a special graphited bronze bushing. Reversible operating arm, roller and bearing pins are of hardened steel.

# Shows Relative Wear of Metals by Abrasion

**A**N investigation of the relative resistance to wear by abrasion of different metals used in the mechanical industries, with different treatments, has been carried out by the Link-Belt Co. of Indianapolis, and a paper on the subject was presented at the recent A.S.M.E. Three-M Congress in Detroit by Charles R. Weiss, chief engineer of the company's Ewart Works. The object of the research was to determine what material and what treatment would assure the maximum wear value for a given expenditure, particularly in connection with power-transmission chains. The project was initiated as far back as 1923, and it was decided at the time to limit the investigation to abrasive wear.

Key steel with from 0.08 to 0.12 per cent of carbon was chosen as the standard material with which all others were compared. Specimens of cubic shape are placed in a lap and subjected to an abrasive action. The lapping machine used comprises a rotating, machined, cast-iron, doughnut-shaped disk which is supplied with a fixed amount of a uniform abrasive in the presence of a fixed amount of water. Water is used for the carrier because of the thinness of its film and its ability to keep the temperature uniform. The speed of the disk was kept sufficiently low so that centrifugal force would not remove the abrasive from the disk. Crystolon of 80 mesh was selected for the abrasive, and it was found that with this machine and this abrasive a uniform abrasive action was obtained. The

loss in weight of the specimen under a fixed specific pressure was taken as an inverse measure of the resistance to abrasion of the material.

The wear-testing machine is shown in the two photographs reproduced herewith. The machined cast-iron, doughnut-shaped disk A is rotated through the worm-gear mechanism shown. B represents cylindrical 1-lb. weights directly above the test specimens, which provide the uniform load on the specimens. The feeders for the abrasive, shown at C, are cam-actuated to deliver abrasive at a uniform rate. The flow of water was controlled by the lubricator D, and the water was fed into the center of the disk, so that the slight centrifugal action constantly cleaned the disk of the abraded material.

The specimens worked with, shown at E, were accurately-dimensioned 1-in. cubes and therefore presented an area of 1 sq. in. to the lapping disk. They are prevented from rotating with the disk by V-shaped knife edges supported close to the disk. The specimens are so held that a radius of the lapping disk is in line with the diagonal of the square specimen surface.

In making a determination of wear value, the loss in weight of a specimen after 3000 revolutions of the doughnut-shaped disk was ascertained by weighing. Results obtained with numerous materials in use in the automotive industry are given in the following table:

## Abrasive Test Values Heat Treating Steels

S.A.E. No.	Brinell	Treatment	Comparative Wear Value
1040	156	As received	1.235
	269	Oil quench—no draw	1.436
	269	Oil quench—450 draw	1.410
	255	Oil quench—900 draw	1.353
3130	183	As received	1.258
	460	Oil quench—no draw	1.837
	402	Oil quench—600 draw	1.651
	321	Oil quench—900 draw	1.363
	248	Oil quench—1200 draw	1.345
	477	Water quench—no draw	1.862
	311	Water quench—1000 draw	1.387
3135	444	Oil quench—600 draw	1.602
	430	Oil quench—700 draw	1.727
3140	196	As received	1.483
	532	Oil quench—no draw	1.901
	555	Oil quench—450 draw	1.946
	444	Oil quench—600 draw	1.627
	311	Oil quench—900 draw	1.483
	340	Oil quench—1100 draw	1.577
3245	196	As received	1.303
	477	Oil quench—no draw	1.883
	418	Oil quench—500 draw	1.602
	402	Oil quench—700 draw	1.552
	321	Oil quench—900 draw	1.485
	241	Oil quench—1100 draw	1.331
5135	170	Annealed	1.412
	555	Oil quench—300 draw	2.029
	512	Oil quench—400 draw	2.342
	495	Oil quench—500 draw	1.869
	460	Oil quench—700 draw	1.858
	364	Oil quench—900 draw	1.639
	293	Oil quench—1100 draw	1.540
5140	163	Annealed	1.254
	600	Oil quench—300 draw	2.375
	578	Oil quench—400 draw	2.348
	555	Oil quench—500 draw	2.192
	477	Oil quench—700 draw	1.878
	387	Oil quench—900 draw	1.788
	321	Oil quench—1100 draw	1.604
5150	217	Annealed	1.451
	627	Oil quench—300 draw	2.490
	690	Oil quench—400 draw	2.308
	555	Oil quench—500 draw	2.163
	512	Oil quench—700 draw	1.870
	418	Oil quench—900 draw	1.700
	332	Oil quench—1100 draw	1.674

S.A.E. No.	Brinell	Treatment	Comparative Wear Value
4150	187	Annealed	1.399
	690	Oil quench—300 draw	2.305
	578	Oil quench—400 draw	2.253
	555	Oil quench—500 draw	1.988
	495	Oil quench—700 draw	1.874
	444	Oil quench—900 draw	1.782
	364	Oil quench—1100 draw	1.785
4650	170	Annealed	1.239
	627	Oil quench—300 draw	2.416
	600	Oil quench—400 draw	2.267
	555	Oil quench—500 draw	1.980
	477	Oil quench—700 draw	1.888
	387	Oil quench—900 draw	1.767
	311	Oil quench—1100 draw	1.564
6150	202	Annealed	1.488
	652	Oil quench—300 draw	2.428
	627	Oil quench—400 draw	2.265
	600	Oil quench—500 draw	2.100
	512	Oil quench—700 draw	1.904
	418	Oil quench—900 draw	1.807
	321	Oil quench—1100 draw	1.543
1350 Cast Steel	207	As cast and annealed	1.457
	460	Oil quench—no draw	1.963
	444	Oil quench—600 draw	2.012
	321	Oil quench—900 draw	1.625
	255	Oil quench—1100 draw	1.529
1025 Cast Steel	149	As cast and annealed	1.130

## Case Hardening Steels

S.A.E. No.	Rockwell	Treatment	Comparative Wear Value
1020	63-C	Carburized—one reheat	2.130
	58-C	Carburized—no reheat	2.117
	64-C	Carburized—one reheat	2.012
	58-C	Carburized—no reheat	2.073
2320	56-C	Carburized—no reheat	2.044
	56-C	Carburized—one reheat	1.922
	56-C	Carburized—no reheat	2.117
	56-C	Carburized—one reheat	1.785
6115	65-C	Carburized—reheat	2.010
5120	60-C	Carburized—reheat oil quench	1.935
	65-C	Carburized—reheat water quench	2.400

## Stainless Steels

Type	Brinell	Treatment	Comparative Wear Value
30C—14.00 Cr.	241	As received	1.430
	627	Oil quench—no draw	2.074
	512	Oil quench—600 draw	1.907
	477	Oil quench—900 draw	2.028
	277	Oil quench—1200 draw	1.462
12C—13.00 Cr.	241	Oil quench—1400 draw	1.391
	460	Oil quench—900 draw	1.643
	418	Oil quench—600 draw	1.538
	418	Oil quench—900 draw	1.865
	387	Oil quench—1000 draw	1.774
	241	Oil quench—1200 draw	1.341

## Miscellaneous Steels

Sample	Comparative Wear Value
Hadfield Manganese Steel—Cast—Work	2.352
Wrought Iron	1.021
Armco Iron	1.038

## Cast Irons

Material	Treatment	Brinell	Comparative Wear Value
Malleable Iron	None	120-140	Rim 1.017 Core .894
Promal		170-190	1.239
White Chrome Iron			1.495
Chilled Iron			1.575
White or Hard Iron		380	1.804
Soft Gray Iron	Annealed	150	.503
Good Gray Iron		190	.509

## Bronzes

	Brinell	Comparative Wear Value
Aluminum Bronze { 88% Copper 9% Aluminum 3% Iron	101	.776
Aluminum Bronze { 90% Copper 10% Aluminum		.629
Phosphor Bronze	52	.378
Manganese Bronze	107	.549



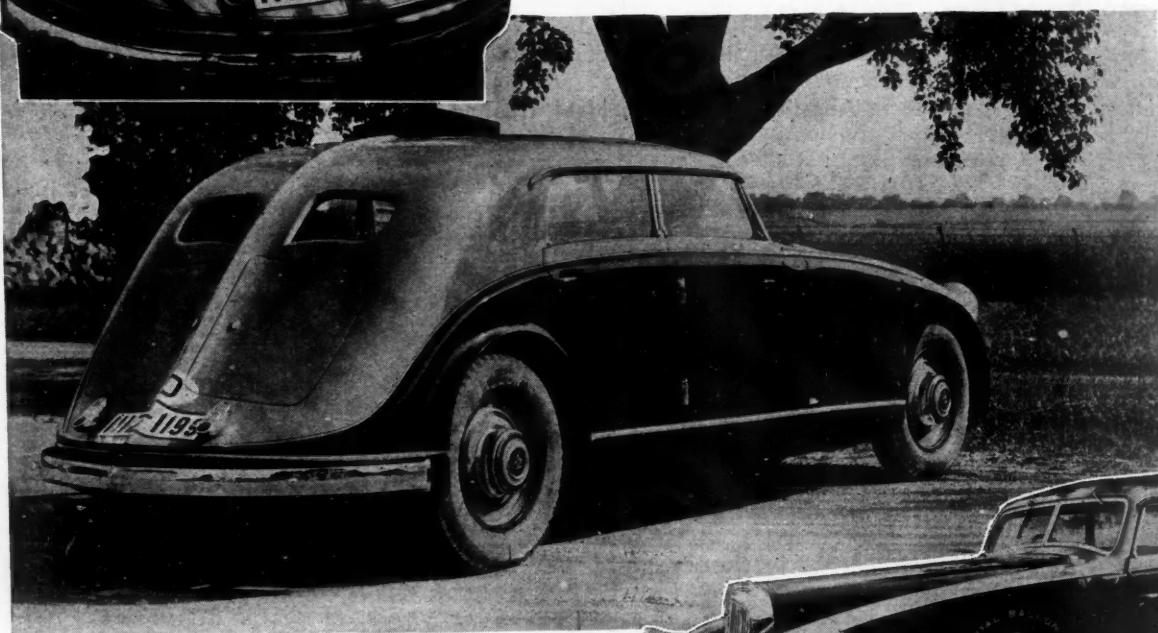
# Maybach Develops Streamline Body of

Ingenious design for concealing spare tires and turtle-back space for luggage add to pleasing lines of German passenger car

**T**HE MAYBACH CO. of Friedrichshafen in Germany has developed an elegant streamlined body for its six and 12-cylinder chassis. The body is exceedingly spacious.

Side panels to waist height are smooth surfaces flush with the wheels, which are inside recesses, while the top line is a sweeping curve from the tip of the front mudguard to that of the rear.

Front mudguards and apron merge into one another in a curve and cover the front ends of the frame and



Above: Rear luggage space, shown with doors open. Center: Sweeping lines of Maybach streamlined car converge smoothly at rear. Below: Tires are carried behind panel doors to increase streamlining

# Unusual Grace

by Edwin P. A. Heinze

Front view of the Maybach streamlined car, showing design of headlamps, fenders and radiator



shackles. The radiator sweeps up and backward and the headlights are let into the mudguards.

Spare wheels are ingeniously located behind locked doors to the rear of the front wheels in the side panels.

The superstructure sweeps slightly inward to the top and the divided, slanting windscreen merges with a curve into the roof, which sweeps down at the back with a central ridge, to the left and right of which the rear windows are located.

Two doors in the rear wall give access to a large

luggage space, where four suitcases find ample room. The front part of the roof is retractable and can thus be opened.

The handles of the four doors are recessed. When these doors are locked, those of the spare wheel rooms and the engine bonnet are simultaneously and automatically locked by an ingenious device.

Space for putting away small articles is provided by a ledge behind the rear seats between their backs and the rear windows.

## Chrysler Adopts Needle-Bearing Universal Joints

**A**Doption of needle-bearing type universal joints on the Chrysler eight is revealed in recently released specifications. This type of joint, which requires no lubrication in service, being packed in grease during assembly, has a large number of very small diameter rollers bearing directly on the pins of the trunnion arms.

The particular joint used by Chrysler is manufactured by Universal Products Corp., and was described in *Automotive Industries* Nov. 21, 1931.

In addition, the Chrysler eight now also carries road shock eliminators or kick shackles in the left front spring. Dual trumpet type horns are now standard equipment on the Chrysler eight. The Imperial Custom eight now has a vacuum booster in the brake hook-up.

### Cobalt Content in Speed Steels

A Method for the Determination of Cobalt in Magnet and High-Speed Tool Steels, by James I. Hoffman. Re-

search Paper No. 445 of the Bureau of Standards. For sale by the Superintendent of Documents, Washington, D. C.

### Diesels in Railroad Yards

**T**HERE is probably no field in which Diesel-electric propulsion can replace steam propulsion to as great advantage as in switching work in railroad and factory yards. The two chief points of advantage of the Diesel-electric switching locomotive are that it requires less personnel for its operation and that all fuel expense ceases the moment the engine is stopped. C. A. Fike, of the Westinghouse Electric & Manufacturing Co., in *Iron Age* of July 28, gives some comparative cost figures for steam and Diesel-electric switching locomotives based on that company's operations. During the entire year 1931 three oil-electric switching locomotives were operated in the Westinghouse plant, one 55-ton 300 hp. and two 70-ton 400 hp. They were operated a total of 8689 hours at a total cost of \$28,832.23, an average cost per hour of \$3.22. The works records showed the cost per hour of operation of steam locomotives in 1930 to have been \$7.23, which would have amounted to a total cost of \$62,821.47 for the hours worked in 1931. Oil-electric locomotive operation therefore saved the company \$33,989.24 during the year and the saving per hour of engine operation was \$3.91.

# Are Branch Factories Abroad

"Watch your step—and look before you branch!"

That's the note of warning sounded by Julius Klein to automotive manufacturers and other American industrialists who may be thinking about opening branch factories abroad.

In brief, clear outline, the Assistant Secretary of Commerce gives practical advice on a vital question. He cites the sad as well as the glad experiences some manufacturers already have had.

You're bound to find interesting this digest of the radio talk made by Dr. Klein over the Columbia Broadcasting System late in July—his last appearance on the air until September 18.

**T**O what extent is American machinery "migrating" to other lands? Are we deliberately turning to a policy of "exporting factories" instead of merchandise? Is it desirable, from the standpoint of our future national welfare, to continue the recent strong movement for the establishment of American branch plants abroad?

So far as the immediate market is concerned within the country where the given branch factory is set up, there are evident benefits derived by American trade. In the first place, there is the probable shipment of American machinery to such plants and a consequent establishment of promising outlets for future supplies and replacements. Sometimes this more than compensates for the loss of the trade in the given finished product with the market involved. For instance, the rearrangement of tariffs in a large Latin-American market made it difficult for our rub-

ber manufacturers to export certain types of rubber goods to that country. They immediately acquired small native establishments and expanded them so that shipments in recent years from the United States to that market in rubberized cloth and other supplies for the industry considerably exceed the values of previous exports of the finished garments.

A similar illustration was afforded in the case of our tire trade with a substantial market in the British Empire, where a high tariff led to the establishment of an American branch factory. This brought about a sharp reduction in our exports of tires to that region—but the sales of tire fabrics, carbon black and other accessories increased at such a rate that their value was soon greater than the peak figures of shipments of the completed product. Now what was the net result from the point of view of the American workman? The employee in the tire factories regrettably suffered, but those in the accessory industries were correspondingly benefited.

Now here is one of the major gains and potent motives: When foreign tariff walls have been so prohibitive as to wipe out entirely the export of the finished American product to a given market, the establishment of a branch factory there has at least salvaged some profits for the owners of the given organization.

Furthermore, the advantages accruing to the branch factory often extend beyond the boundaries of the country where it is established. The best illustration of this is in the case of our very large participation in the industrial upbuilding of Canada. Preferential duties favoring all industries within the British Empire have enabled those branch plants to build up very substantial trades with Australia, South Africa, India and the other dominions and de-

"... Automobile assembling plants abroad have resulted in economies in shipping..."



August 20, 1932

Automotive Industries

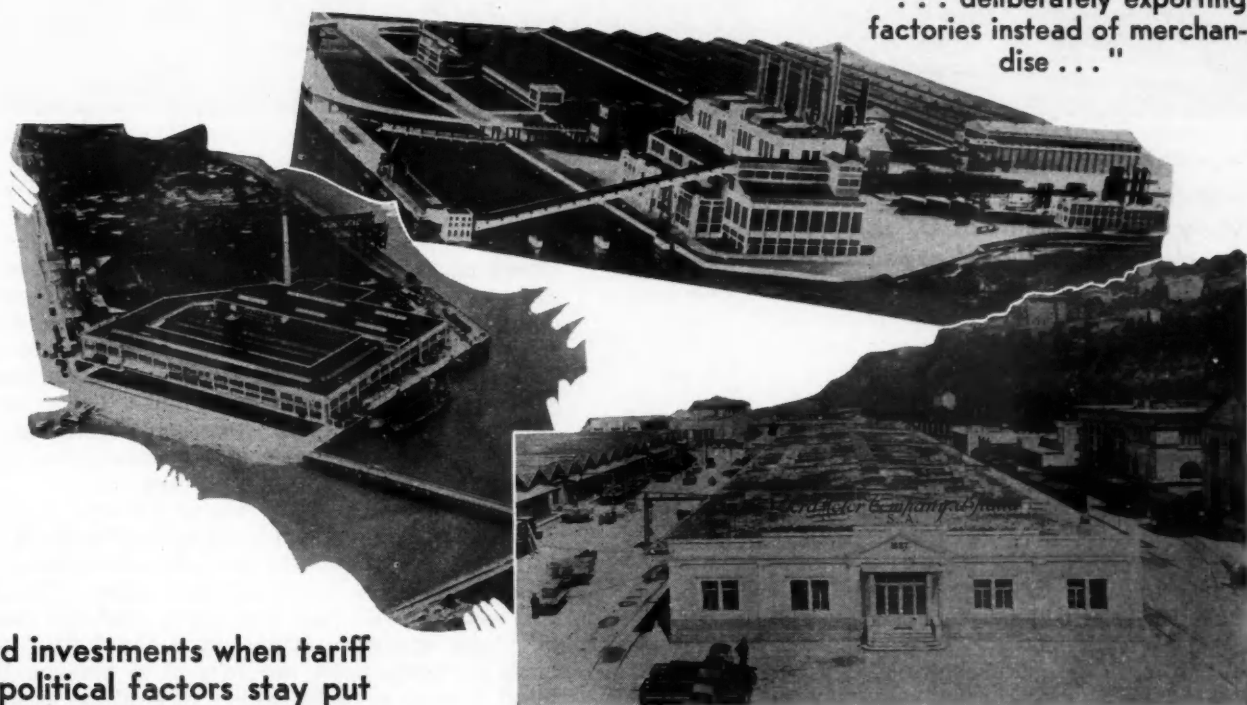


# Profitable?

by Julius Klein

## "Maybe—Maybe Not"

"... deliberately exporting factories instead of merchandise ..."



Sound investments when tariff and political factors stay put in foreign countries. But sudden and subtle changes are quite common

pendencies. This has opened up a very large market which otherwise might not be accessible at all to the home plant in the United States.

One conspicuous saving achieved through the branch plant is in the factor of transportation. Automobile assembling plants have been established abroad so as to give the owners the economies of knock-down shipments. Often these enterprises have soon evolved into more pretentious efforts; the building of special-type bodies to meet local preferences, of tractors, of accessories, and so on, until a full-fledged industry has been developed. This factor of advantage with respect to transportation applies not simply to the shipment of knock-down machinery, motors, and so forth, but also to commodities which deteriorate sharply in transportation. Consequently we see American branch factories scattered around the world manufacturing confectionery, ice cream, beverages, chewing gum, and many similar lines.

Lastly, we must recognize frankly the admitted advantage of the branch plant as a means of avoid-

ing much of the excessive nationalistic propaganda now being leveled in many countries against all foreign products. Campaigns are carried on with considerable intensity to induce the consumers in each case to buy "native" products. This situation has had a good deal to do with the opening up of American branch factories abroad. A striking illustration of this situation is the aggressive advertising campaign now being carried on in this country by a number of leading British railways and municipalities, endeavoring to bring about the establishment of American factories in Britain so as (I quote one of these advertisements) "to avoid anti-American trade propaganda."

These, then, are the favorable factors—the considerations that may lead an American manufacturer to establish a branch factory abroad. Let us look now at some of the difficulties and dangers—the elements of possible folly—involved in such an undertaking.

In the first place, I believe there is often too much haste and rash impatience in such a decision to begin the manufacture of goods abroad. Executives are moved by the impulse to leap at once across or circumvent such barriers as tariffs, quotas, exchange



"... Watch your step—look before you branch...."

Many foreign plants of U. S. manufacturers are closed by political expediency because of clashes of parties—not because of economic reasons.

embargoes, patent restrictions, and other foreign measures that seem to hamper the ordinary flow of merchandise. Manufacturers are often seized with the fear that these measures will prove insurmountable obstacles to their export trade. And they make the grave mistake of jumping to the conclusion that the barriers are necessarily permanent.

That may or may not be the case—and the chances are heavily against it. In every phase of business and of national policies, this is a time of exceptional turmoil, flux, confusion, and swift change. So, many of the foreign measures that seem, at the moment, to be formidable and forbidding are apt to be, in reality, of a very temporary nature—mere stop-gap and makeshift political devices. With respect to any one of them, it may be that only a few months (or maybe weeks or days) will elapse before we see a drastic alteration in it. This is especially true of foreign import restrictions, quotas, and similar fiscal measures of momentary expediency. If they are likely to be transformed or to vanish into thin air, upon the shortest notice, is it the part of wisdom to spend much money and effort in putting up abroad a factory of steel and stone and large capital—simply to get around an impediment that is admittedly so shifting and so tentative? What a foreign government does today it may undo tomorrow—and the hasty factory builder may be left "holding the bag."

### Foreign Tariffs Unstable

Foreign tariffs, in sharp contrast to our own, are apt to change not only quickly but subtly and elusively. In some countries the executive branch of the government, speaking through some minister sitting in the legislature, may announce an alteration overnight—with no assurance that the same thing will not happen again within a few weeks, and just as abruptly. The rates may be raised or lowered—or dubious, opportunistic interpretations may be introduced. One American automobile manufacturer who had set up a costly branch plant in a large European city, after having had firm governmental assur-

ances of favorable rates on the chassis and other car parts to be imported, found himself involved soon in a maze of evasion, wrangling, and complex negotiations as to the definition of a "chassis." The privileged rates on which his branch factory had been based disappeared overnight. There are very few overseas plants of American firms that have not suffered from the costly consequences of such uncertainties and shifty quibbling.

This danger is enhanced, of course, by the innumerable clashing political parties in most of the European countries—15 in Czechoslovakia, for instance, and no less than 25 in Poland. This makes for endless coalitions and blocs, and the handling of grave economic issues by compromise. Under such circumstances, the fate of a foreign branch plant is subject to the whims of political expediency to a degree absolutely unheard of under a two-party government. To subject business to such excessively precarious hazards is obviously taking extreme chances, warranted only by unmistakable necessity.

### Those Overseas Laws!

While I am considering the governmental phases of this question, I must not fail to mention the difficulties presented even by the more ordinary foreign laws governing industry and commerce. Such laws control the operations of the branch plant. And the vagaries and intricacies of commercial legislation abroad are sometimes almost incredible. The provisions are apt to be ambiguous and tangled. And for some wholly unconscious infraction the hand of the law may descend on the luckless branch factory—to the manager's amazed bewilderment and subsequent extreme annoyance. It is hard enough in our own country, with the aid of the most skilled corporation lawyers, to keep informed of legal requirements; it is much harder to know, abroad, what perils may lie in the text of voluminous and possibly dust-covered statute books, phrased wholly in a foreign tongue.

The American branch factory abroad may find itself weighted down with the assessment of heavy contributions for doles and pensions, disability bonuses, housing payments, and numerous similar social charges. I would not question for a moment the desirability of the ultimate purposes of most



such funds—but their administration and control abroad through national political agencies, rather than by local entities or internally by the workers and owners of the industries themselves (as is largely the case in the United States), injects political complications and piles up tax burdens upon many American branch factories.

Then there is another element—the understandable but inevitable resentment of native competitors against the aggressive Yankee “intruder.” Although it may not always find successful expression in open-and-aboveboard competition, this resentment is likely to manifest itself through political subtleties which are infinitely more difficult to combat.

One thing to be borne in mind is the relative instability of labor legislation abroad during these troubled times. This has imperiled and even destroyed American enterprises which had been launched under most auspicious circumstances.

We are obliged to admit frankly that the impulse to set up branch factories abroad is bound to have numerous unfavorable reactions on our export trade. Of course, as I have said, such branches may stimulate our export business in lines other than the finished products they turn out. But even allowing for these compensations, we encounter all too frequently a development that “gives us pause.” Here is what is apt to happen: Such factories do not confine their sales to the particular country where they are lo-

cated. The small market of that country is very apt to prove inadequate for an industry that is organized on an American mass-production basis. To survive it must strive to cultivate a broader field. So it sets to work to get orders from other foreign markets—as many other foreign markets as possible. And in those other foreign markets the branch factory begins to compete with the parent organization and with other American producers and exporters in the same line. Quite conceivably that may prove disastrous for our commerce as a whole. Certainly we do not want to go so far as to “hamstring” ourselves, and to injure not only American labor but also American export talent, American freight forwarders, transport agencies, bankers, and other elements that derive a livelihood from, and render vital services to, our important export trade.

There is no terse, offhand answer to the question of whether the branch-factory movement is good or bad. It is not wholly one or the other—it has elements of each. The reply must vary—not only with each industry, but with each individual plant. In these troubled days it seems necessary to counsel the utmost caution in this matter. The “safety factor” in the enterprise is difficult to calculate.

To any American manufacturer who finds himself seized with a desire to “go foreign,” I would give this earnest advice: “Watch your step—and look before you branch!”

## Frame-Stiffness Factor is Determined

IN the discussion of the paper on Frame-Design and Front-End Stability by Clyde R. Paton, presented at the S.A.E. Summer Meeting, T. E. M. Wheat, chassis engineer of the Chrysler Corp., gave the following equation for what he calls the frame factor:

$$200 = W L / y,$$

where

$W$  = front-wheel load in pounds

$L$  = wheelbase in inches

$y$  = rigidity of frame in pounds per inch of distortion.

The shake or vibration of parts mounted at the front end of the car is determined by means of modified pedometers referred to as wobble meters, which are applied to such parts as the radiator, headlamp, etc. Test runs are made over a road  $5\frac{1}{2}$  miles long, at a constant speed, usually 60 m.p.h., with the tires inflated to a given pressure, and the wobble meters integrate the deflections of the parts to which they are applied. The stiffer the frame, the less will be the integrated deflections.

In making deflection tests, the Chrysler Corp. holds the frame down rigidly at three points and determines the force required to raise the free corner 1 in. The frame, however, is not held down at the extreme corners, but at the forward points of attachment of the rear springs. The reason for this is that, owing to the use of “floating power,” which eliminates the engine crankcase as a cross member, the forward and center portions of the frame are made much stiffer than the rear portion. If the frame were held down at the extreme rear ends, most of the deflection would be due to the comparatively flexible rear portions of the side members and the stiffness of the center and front

section, which is important, would not be so accurately reflected by the results. Another advantage claimed for this method of determining frame rigidity is said to be that the distance between supporting points on the same side of the frame is about equal to the wheelbase, which represents the distance between supports in normal operation.

The accompanying table, given by Mr. Wheat, shows not only that it is often possible to greatly increase the torsional stiffness of a frame without increasing its weight, but also that the average shake or amplitude of vibration of the radiators and lamps is reduced in even greater proportion than the stiffness of the frame is increased.

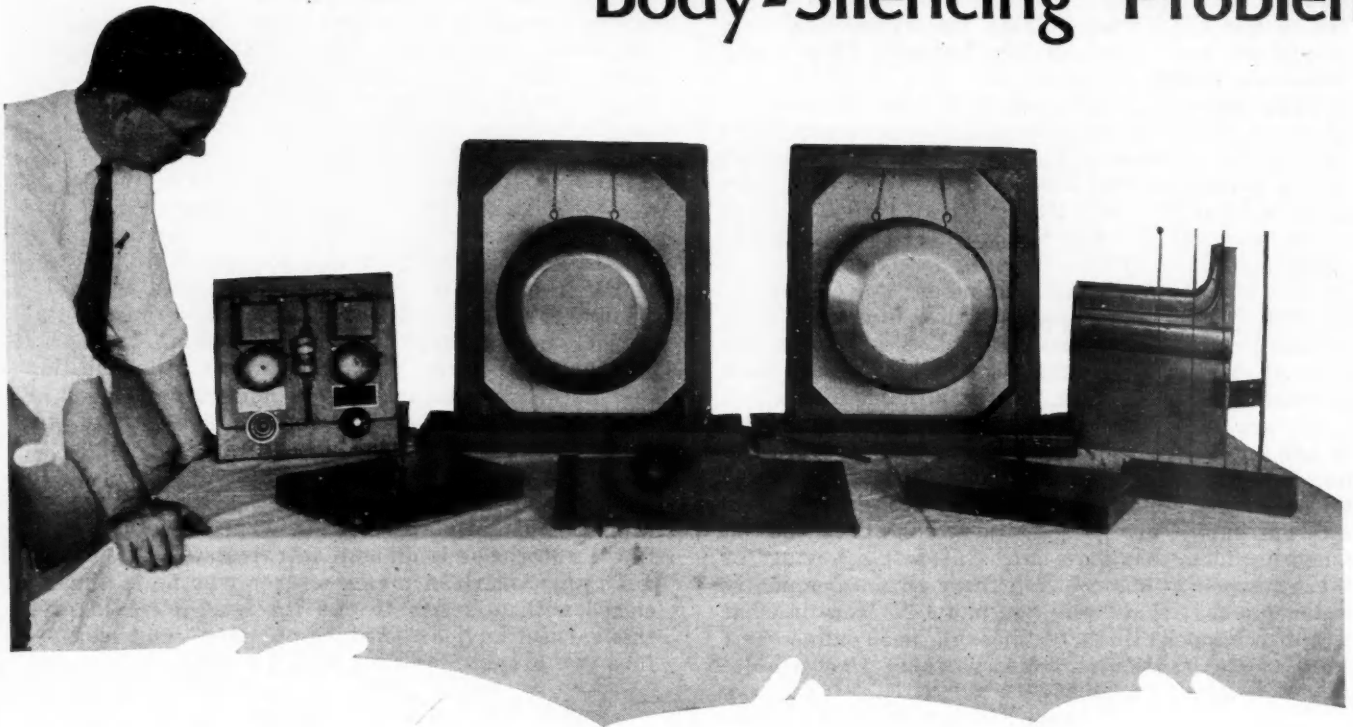
The frame factor of 200 is said to be about right for cars having floating power and other features of Chrysler design in that it gives acceptable road performance. Of course, there will be less front-end shake with a stiffer frame, represented by a smaller frame factor, and the ideas of the engineering staff as to what constitutes acceptable road performance are constantly changing.

Front-End Shake With Standard and Test (Rigid) Frames

	Frame Weight Lb.	Frame Stiffness Lb. p. in.	Front-End Shake In.
Car A	267	460	0.43
	214	860	0.19
Car B	212	305	1.10
	207	1,000	0.19
Car C	310	400	0.52
	292	910	0.22



# Body-Silencing Problems



**"THUD"** or "clang-clang." Sound or noise. Like pulling rabbits out of a hat, a group of research men at the E. G. Budd Mfg. Co., Philadelphia, drew on a bag of tricks which led early this year to a happy solution of the problem of body silencing. At least it was good enough to get the OK of a number of the largest users of steel bodies.

By a skillful blending of scientific method and good common sense they have succeeded in driving all those troublesome hidden noises out in the open and reducing them to a whisper. When it was all over they had developed a new sound-deadening material and a production method. The material is a special impregnated rag felt sheeting which is cemented on all the door and body panels. And it puts the damper not only on noise but also on heat and cold.

Early last year when there was much ado about suppressing noise, we made an intensive study of the best body-silencing methods then in use. This study, published in two parts, <sup>(1)</sup> uncovered a wide variety of methods and materials, some quite elaborate but all designed to make things more comfortable for the people who ride in automobiles. Under the circumstances it was only logical that someone would seek the "one best way," good enough to please many different engineers and through standardization produce a single method which would be not only effective but economical.

As pointed out in <sup>(1)</sup>, there are a number of forces at work tending to produce noises in a steel body. These noises may be isolated as follows: 1. Due to closing of doors. 2. Due to drumming in door panels. 3. Due to drumming in body panels. 4. High frequency

vibrations of dash and similar sheet metal parts.

To some extent, particularly in the matter of door slamming, the same problems exist in the case of a composite body. As a general rule the rumbling or drumming of door and body panels due to vibrations transmitted by the engine and running gear may be damped successfully in a number of ways. But the troublesome problem has been to cushion the effect of a slammed door so that instead of a tinny clang you get a pleasing solid thud. According to the best minds you've achieved success when the proud owner exclaims, "Boy, that's a real steel door!"

On this premise a large number of people were asked to cast their vote on the noise quality of doors which had been sound-proofed in many different ways. The consensus was that to most people a dull thud which sounds "good and solid" is more pleasing than the entire absence of sound and unquestionably more desirable than the usual high-pitched, tinny medley of noise.

To demonstrate one's reaction to the quality of sound, the simple apparatus shown in Fig. 1 was set up. Here are two brake drums, one lined inside with the new sound-deadening material, the other in its virgin state. Tap the first with a rubber or metal hammer—you get a short, solid thud; tap the other—you get a sustained, tinny jingle. The same effect is produced with the flat and curved door panels which are seen on the table. A number of steel rods fixed upright in a stand at the right show that the heavier, stiffer sections have less amplitude and come to rest quicker when vibrated by the same force. One of these rods shown with the weight at the upper end demonstrates the dampening effect corresponding to the stiffening of the body panel.

Before adopting what appeared to be a rather expensive construction involving the use of large sheets of sound-deadening material, it was decided to test the suggestion that there are certain points in the panel

<sup>1</sup> "Body Noises Reduced to Meet Demand of Owners," by Joseph Geschelin. *Automotive Industries*, April 4, 1931.

"Demand for Noiseless Bodies Brings Forth Variety of Insulating Materials and Methods," by Joseph Geschelin. *Automotive Industries*, April 18, 1932.

# Fall Before Advance of Budd Research

by Joseph Geschelin

Science and common sense at the E. G. Budd Mfg. Co. Plant develop new sound-deadening material which also provides heat and cold insulation

which, when properly deadened, would cause the whole panel to be deadened. Accordingly, doors without any sound-deadening devices, such as strainers, braces, etc., were assembled and mounted on cars. The surfaces of the door panels were then covered with rubber suction-cups. Upon shifting the cups so as to change their position and the number of cups in place at any one time, a very striking fact developed. Only a slight change in the position and number of cups produced marked differences in the pitch and quality of sound, and it finally developed that there are five critical points which, if damaged, will result in a dead-sounding door.

This experimental fact was then tested by making up doors each of which had a different type of mechani-

cal damping construction. After assigning a value of 10 to an acceptable door, five impartial observers were asked to judge each door independently. The results are given in Table 1.

Door No.	Sound-Deadening Value
1	1.0
2	6.0
3	2.0
4	4.0
5	3.0
6	6.0
7	7.0
8	8.0
9	9.0
10	4.0
11	2.0
12	9.5
13	7.0

The highest value was given to door No. 12 in which the sound-deadening device consists of one horizontal brace underneath the window opening and three smaller vertical braces in the lower part. These braces cover the five points which correspond with the critical zones determined experimentally.

It was immediately evident that this mechanical construction was expensive and could not be tolerated in production. From this point the investigation naturally turned to some cheap lining material. Out of a great variety of available materials, the one that gave the best result was a special grade of impregnated rag felt cemented securely over the entire panel. This was installed on the panels of several cars. The amount of sound deadening was surprisingly good and far better than most of the more costly methods. In fact, it was given a value of 9.0.

According to the report of the research division, "One of the most severe tests which a sound-deadening material must undergo is the heating in the oil primer ovens in the paint lines. As has been mentioned, the maximum temperature reached and the time at this temperature are not the same in all automobile plants, but 300 deg. Fahr. is well above the maximum tempera-

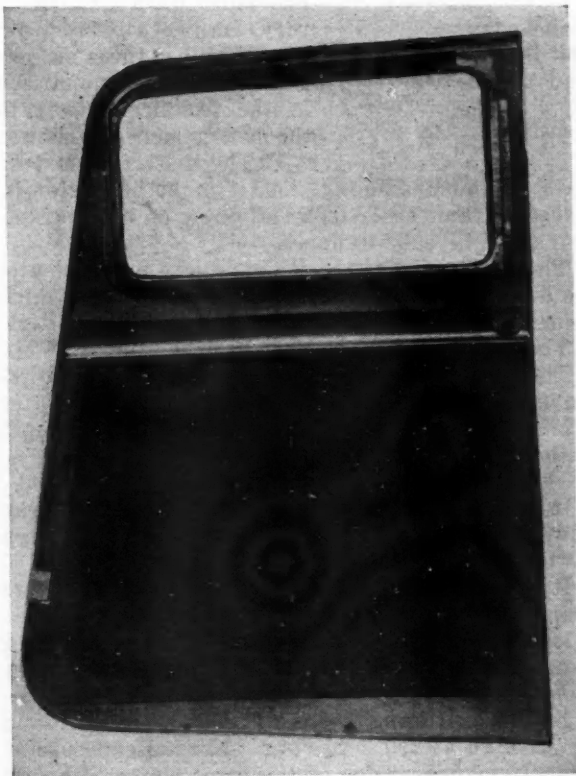


Fig. 1—Door panel covered with impregnated rag felt lining

ture of any of our customers. Experimental work was carried out with the leading manufacturers, and an impregnated rag felt was finally developed which successfully met the specifications necessary.

"Tests comprised heating the felt to different temperatures for different times and noting loss in weight, signs of deterioration, sweating or bleeding. Cones were made, inverted in ring stands, and filled with water in order to note waterproofness. Weighed specimens were immersed in water for different lengths of time and reweighed to note change in weight. The felt was subjected to temperatures of 10 deg. below 0 deg. Fahr. and deformed at this temperature to note any signs of brittleness. Tests were made of the felt by exposing it to the weather. Specimens were placed on the roof of the plant, in the doors of employees' cars, etc.

"In every case the impregnated felt withstood these tests.

"The proper cement was and is probably the most difficult problem in connection with the use of this type of pad. Over a hundred samples of cement have been carefully tested. These cements may be roughly divided into four main types:

1. Water emulsions of asphalt types.
2. Resin-solvent types.
3. Oxidizable oil types.
4. Gel type.

"In order to test these cements, samples of felt were cemented on curved panels and subjected to heat, cold and exposure to the weather tests. It was found that type No. 4 was unsatisfactory for our purpose. Curved panels were used for these tests because it was found that the initial adhesive qualities of the cement were of great importance on account of the slight amount of spring in the felt. After much experimentation a cement of the oxidizable type manufactured especially for us was adopted as standard.

"The cement is applied to the pad by means of especially designed machines. A standard glue-coating machine was purchased, but due to the high viscosity of the cement, it proved to be a dismal failure. The machine was redesigned and the results have been very good. The cement is applied to one side of the pad

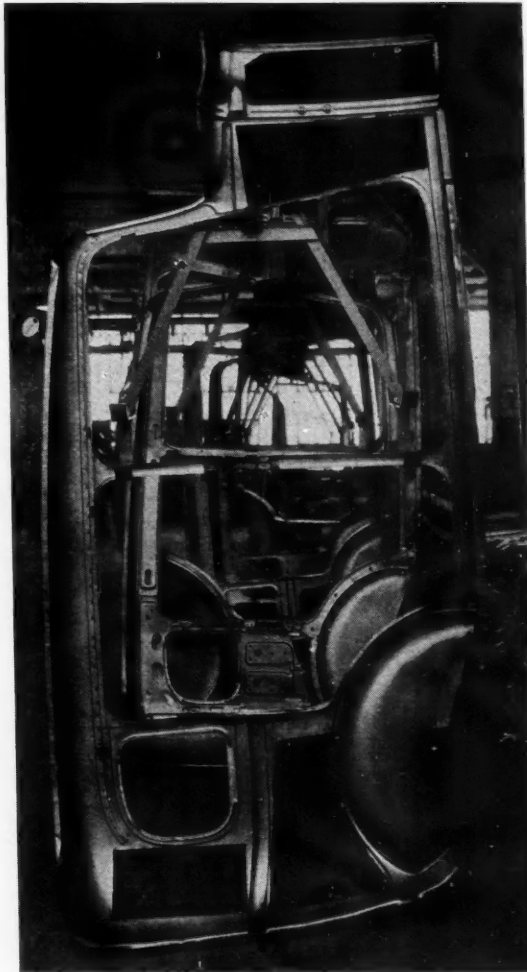


Fig. 2—Single piece body side lined with the rag felt sound-deadening material

Note the slits in the lining in this illustration put in to permit the lining to conform to curved panels

as it passes through the rolls and on to the conveyor. The speed and length of the conveyor, together with the low temperature electric heaters above the conveyor, were selected to insure uniform and correct 'setting' of the cement."

The pads are placed in the panels as shown in Fig. 1 and Fig. 2, and efficient adhesion free from air bubbles, etc., is achieved by rolling with rubber rolls. It was found that the cost of perforating the pad to prevent entrapping air bubbles would be more than the pad itself and considerably more than the cost of rolling. The slits which may be seen in the pads are put in to prevent buckles from occurring when cemented to curved surfaces.

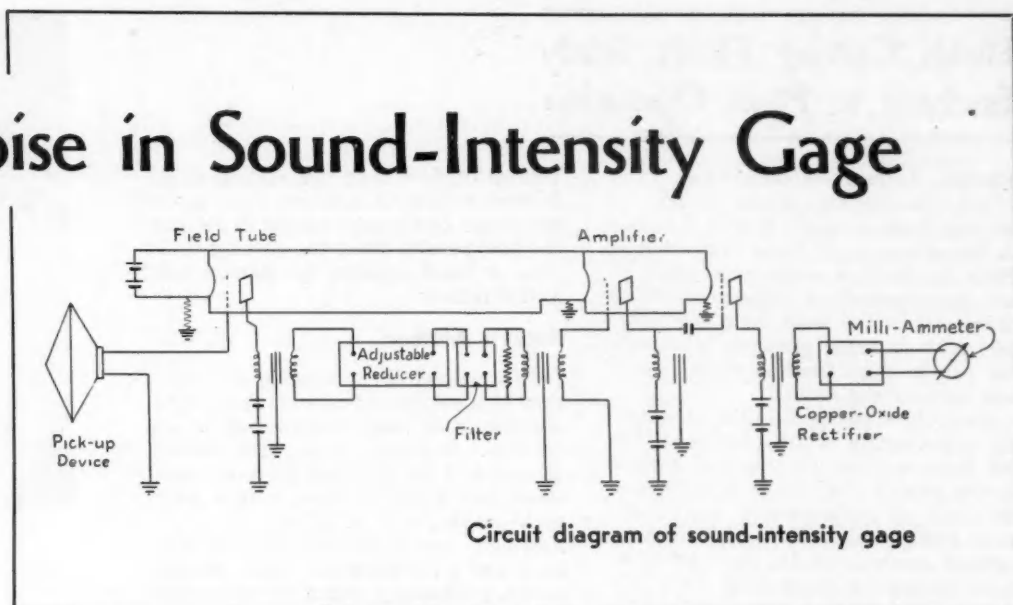
It is obvious from the foregoing that an acceptable sound-proofing material must fill a number of very important requirements. What these are has been succinctly summarized in the technical report to the management as follows:

1. The material must be actually sound deadening, i.e., it must be better in this respect than other materials now on the market.
2. It must be easy to apply.
3. The material must be clean. Dirty material promotes dirty work and endangers the parts with which it comes in contact.
4. The material must be neat in appearance.
5. The material should be waterproof in order to resist damp, mildew, etc. If a material absorbs water it becomes heavy and soggy and will cause a more rapid corrosion of the steel.
6. The material must be odorless.
7. It should be unaffected by the slushing oil spray with which it comes in contact when passing through spray booths.
8. It must be light in weight, inasmuch as it covers a great percentage of the sheet metal area.
9. It must withstand the temperatures and times of exposure at these temperatures in the paint and lacquer lines. Some plants operate with a maximum temperature in their priming ovens of 200 deg. Fahr. and others as high as 290 deg. Fahr. Normal exposure at these temperatures is for two or three hours, although occasionally the material is subjected to longer periods.
10. Finally the material must be low in cost.



# Filters Noise in Sound-Intensity Gage

by P. M. Heldt



A "NOTE" on a sound-intensity gage (*sonde phonique*) was presented recently to the French Academy of Sciences by J. F. Cellerier. The author points out that the sound intensity may be scientifically determined only in the case of pure sounds and not in the case of indefinite noises. This makes it necessary to select the sounds emitted by appropriate electric filters. For the sake of greater precision of measurement, microphonic currents are substituted for the acoustical vibrations.

The acoustic or sound gage takes account of these desiderata. It comprises the following essential parts (Fig. 1):

1. A double-cone pick-up microphone of very great sensitivity, which facilitates the choice of a handy amplifier which is constant within the widest possible limits of reception.
2. A field-amplifying lamp placed between the microphone (whose impedance may be varied with the frequency) and the constant impedance-reducing unit of 800 ohms. In this way distortion of the frequency within the practical working limits is obviated.
3. An adjustable reducer, the control lever of which is so manipulated that the potential difference at its terminals is constant.
4. A series of selective filters. The latter are adapted to intervals of frequency as narrow as possible, from the lowest to the highest frequencies, and so arranged as to make it possible to connect them in the circuit either in series or in parallel.
5. An amplifier. This is a three-electrode bulb as commonly used in radio receivers.
6. A measuring instrument consisting of a milliammeter, preceded by a rectifier of the copper-oxide type; its pointer indicates the volume of the plate current of the last lamp on a graduated scale. In making measurements, the adjustable reducer is manipulated in such a way that the measuring instrument constantly shows the same reading.
7. Calibration—The complete outfit comprises four light, portable cases. It is calibrated in advance with respect to a number of pure notes, each of known frequency, produced by means of standard tuning forks

in the testing laboratory of the Conservatoire National des Arts et Metiers. For ordinary uses it is also calibrated in decibels, a rather arbitrary unit which has been adopted by Americans for measuring the intensity of sounds.

**Results Obtained With Instrument**—By means of this instrument one may determine the intensity of the sounds produced by various musical instruments, which varies with the efforts of the player and also with the note. Thus brass instruments and drums give an intensity of about 50 decibels at a distance of 10 meters (32.8 ft.), while stringed instruments, which are not so loud, produce an intensity of 15-20 decibels. Ordinary phonograph disks of single tone give from 22 to 45 decibels according to frequency, at a distance of 4 meters (13.1 ft.).

An automobile horn operated by air under variable pressure may give from 40 to 50 decibels at 4 meters.

The sound-intensity gage also furnishes a simple means of determining the vocal power of singers, and particularly the variation of vocal power with the note. Some artists attain 55 decibels, others hardly 25 or 30, which corresponds to a sonorous intensity  $10^3 = 1000$  times less.

The acoustical qualities of a hall are studied by placing the sound-intensity gage successively at various points of the hall, either to determine the audibility of sounds originating on the stage, etc., or to determine the intensity of sounds entering from outside the hall.

The efficiency of certain noise-insulating materials also has been studied by means of the gage. The sound transmission factor  $\sigma$  has been defined as the ratio between the intensity of sounds from any given source transmitted through the material, to the sound transmitted directly. It is related to the corresponding reduction in sound  $n$  by the equation

$$n = 10 \log \sigma$$

This factor varies with the characteristics and the thickness of the sound-insulating material and is also dependent on the frequency.

Samples of material giving values of  $\sigma = < 20 \times 10^{-4}$ , if properly applied, give a very satisfactory noise-insulating effect.

## Holds Cutting Fluids Study Essential to Plant Operation

EDITOR, *Automotive Industries*:

Mr. Geschelin's recent article on cutting fluids is timely in that it brings to the attention of those interested in their application some conception of the fundamentals of these products as developed by the work done in connection with extreme pressure lubricants for use in high tooth pressure gear-sets such as the hypoid.

Heretofore the possibility of effecting a saving in a machine shop has not been realized by those in charge to the extent that it should, due to the lack of information concerning these process oils. This condition was further aggravated by the fact that those companies marketing such oils had to make general recommendations for their application, which would not apply to some machining operations in certain plants.

Again lacking fundamental knowledge, salesmen had a tendency to overstate the merits of their products, and engineers had to use the cut-and-dry method of application.

### Results Uncertain

In this way results were uncertain and shop superintendents at some time or another had unsatisfactory experiences in carrying out cutting oil tests, which had a tendency to make this question a closed issue until such time as trouble developed from this source. Even then it was with reluctance that competitive oils were brought in for trial.

Now that some definite facts are being brought to light on the application of cutting fluids, production men should realize the possibility of equating cutting oil cost to tool life, as larger savings than ever can be made with the improved products that will undoubtedly be marketed as a result of this new knowledge on sulphurized oils.

Lard oil mixtures of mineral oil only show to advantage where wetting is desirable. High speeds and light feeds are the usual conditions where this action applies. Machining screw stock in a Brown & Sharpe automatic is an example of the type of operation where these mixtures would be desirable. The lard oil adds some lubricity to the mineral oil and permits of a better finish than if mineral oil alone were used.

### Seeks Balance

The proper degree of dilution of a soluble oil depends, I believe, on the balance between refrigeration and lubricity for the work in question. Marked differences in tool life have been observed with different dilutions and they have not always been in favor of the more concentrated mixtures.

Another factor influencing the effectiveness of a soluble oil mixture is the

volume of flow over the cutting edge, a large volume of solution (not under pressure) being more useful in getting the best results from the cutting tools than a small stream, no matter how well directed.

### Reports Method

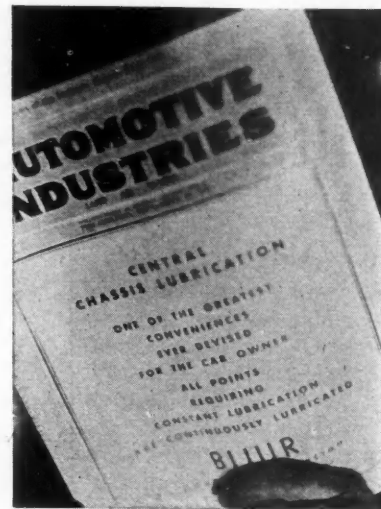
The method of computing the mixture of a soluble oil which I have used and found to check very closely is as follows: Measure 10 cc. (100 tenths of a cc.) of the solution from the machine into a 100 cc. flask with a long neck marked off in tenths of a cc. Add 2 cc. conc.  $H_2SO_4$  and shake gently until the oil separates. Add enough water, preferably warm, to bring the separated oil into the neck of the flask. Allow to stand for at least half an hour or longer if possible. Read the amount of separated oil in tenths of a cc. The calculation is as follows:

Amount of separated oil in tenths of a cc.	= A
Amount of water in solution from machine	= 100-A
Mixture of soluble oil to water	= A
	100-A

e.g. 4 tenths of a cc. of separated oil observed in neck of flask	= A
Amount of water in solution from machine 96 tenths of a cc.	= 100-A
Ratio of soluble oil to water 4	= A
	96 = 100-A
	= 1 to 24

Warm water aids the separation and gives a sharper line of demarcation between the oil and water. Long standing of the separated mixture gives more accurate results.

D. G. PROUDFOOT,  
Phillips Petroleum Co.,  
Bartlesville, Okla.



## Gasoline and Fuel Oil Prices in England

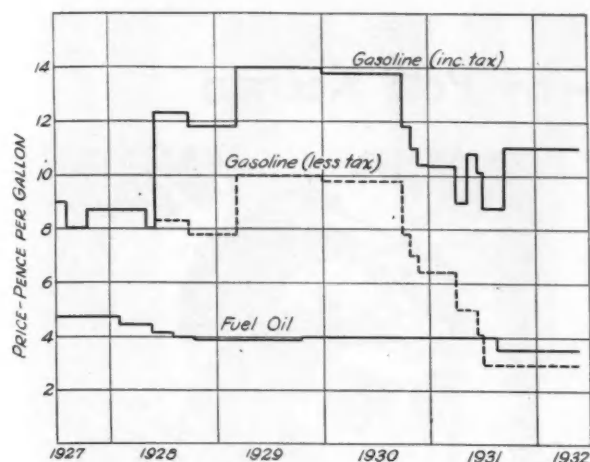
EDITOR, *Automotive Industries*:

With reference to my correspondence to you on oil engines, there are some figures given in the account by Ernst Steinitz in your issue of July 9, page 43, which do not seem to be correct.

### Submits Cost Chart

As you also very kindly printed a review of our own paper in the same issue on page 48, I think it is worth while to send you a copy of a chart which I have prepared of figures supplied by the Shell-Mex Co. The price of fuel varies, of course, according to the quantity purchased and the figures in the chart apply to the price paid by operators of fleets of about 150 vehicles.

# The Forum



As the oil engine situation depends so much on the fuel situation, I think you should have an accurate account of the basic conditions on which our comparison was made.

P. E. BIGGAR.

## Suggests Use of Photo-Electric Cell In Road Tests for Anti-Knock Quality

EDITOR, *Automotive Industries*:

Referring to the article on Road Tests for Detonation Study in the Aug. 6 issue of *Automotive Industries*, may I suggest a method I have used for other purposes which may eliminate the fault of the Bell audiometer in failing to differentiate between the overall engine noises and the detonation noise.

My method is to substitute for the present Bell sound pickup, a unit comprising the pressure element of a Midgley optical indicator; to mount this unit in a special cabinet with a light beam impinging on the oscillating mirror and reflected to an optical gap in proper focal relation to a photo-electric cell.

Proper adjustment can be made to keep the gap dark at all times except when detonation occurs; and the degree of lighting will bear practically a straight-line relationship to the instan-

taneous pressures produced by detonation.

The output of the photo-electric cell is put through an ordinary head amplifier to bring it up to microphone level and then through the Bell audiometer in the usual manner. The output meter reading will correspond to the noise level of the detonation knock alone, without interference from extraneous noises.

E. F. HALLOCK,  
Vacuum Oil Company, Inc.

## Administrators Hit for "Meddling"

EDITOR, *Automotive Industries*:

While we are at it, let us set down the number of occupations, trades, professions, businesses and sports that have to be licensed or registered at some place or other in this land of the free and home of the brave.

I can think of lawyers, doctors, dentists, pharmacists, realtors, public school teachers, engineers, architects, barbers, undertakers, electricians, plumbers, stationary engineers, hunters, fishermen, peddlers, newsboys, automobile drivers, automobiles, taxicabs and hacks, ice-cream parlors, restaurants, cigar stands, gasoline stations, apartments, hotels, steamboats, steam boilers, elevators and dogs. They even tried to pass legislation in Massachusetts to license cats!

The delusion of the whole thing is that while all this is done to protect the public it does not in any adequate measure do so. The regulatory bodies

or officials quickly become rubber-stamp activities, their duties become largely perfunctory, with the exception that they constantly endeavor to increase the scope of their activities by new legislation, never missing an opportunity to increase their salaries and the security of their jobs. A recent survey has disclosed that while our total population has multiplied four times, the cost of government has increased about twelve times. Truly, these regulatory bodies have been busy in their own behalf!

Their efficiency as regards motor vehicle regulation can be directly challenged, however. Some states have laws requiring that drivers be licensed, others do not. I challenge any motor vehicle administrator, the AAA or any other organization which has sponsored additional nuisance legislation in the past, to produce an honest set of statistics which will prove that there are more accidents per car in the states that do not license their drivers than in the states that do. It cannot be done!

And as to the cost to the public of all this regulation, let us inquire a bit. A statement was recently published that it required \$350,000 for the office of the Traffic Director in Washington, D. C., for a year. I understand the director himself commands the handsome salary of \$10,000 a year. The total population of the District is around half a million, and the number of motor vehicles is around 120,000. In round figures, the active population of the city pays \$1 a head a year, \$5 a family, or \$3 a motor car. Personally, I prefer to hustle for curbstones a few times a year or to pay \$5 for an accident insurance policy and get real protection. Add to this the cost of paying for other kinds of protection and we begin to see where our tax money is going.

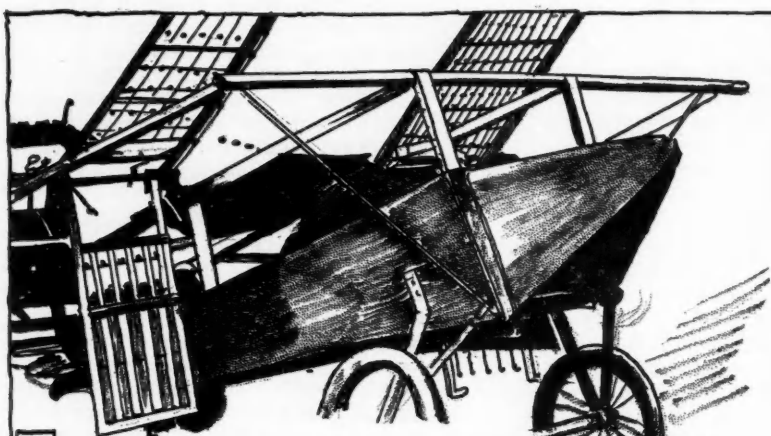
No form of regulation which attempts to investigate something more than half of the total population can hope to be effective and will most certainly cost a staggering sum of money. The 95 per cent of law-abiding motorists should be totally ignored. Instead, motor vehicle regulation should concentrate upon the 5 per cent of lawbreakers and deal harshly with them, so much so that they would know themselves to be watched and mend their ways.

The motor vehicle administrators would do well to stop advocating more legislation and mend their fences against the wrath of a taxpaying public which is finding it harder every day to earn a dollar, and resents supporting a horde of public officials who, like pigs, have their snouts in the public tax trough, draining it dry, and squealing for more so vigorously that they never fatten to serve any useful purpose, but only to break down their swivel chairs. Their day of reckoning is not far off. *Automotive Industries* might well hasten it.

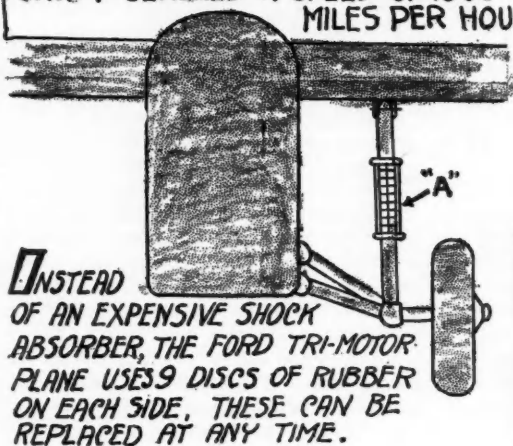
PAUL H. FRANCIS.



# Automotive Oddities—By Pete Keenan



THE DESIGNER OF THIS QUEER CRAFT CLAIMED A SPEED OF 1500 MILES PER HOUR.



INSTEAD OF AN EXPENSIVE SHOCK ABSORBER, THE FORD TRI-MOTOR PLANE USES 9 DISCS OF RUBBER ON EACH SIDE. THESE CAN BE REPLACED AT ANY TIME.

AN AUTOMOBILE ACCESSORY DEALER HAS THE NAME OF THREE CARS FORD EARL MAXWELL  
*Fansville, Ohio.*



**NORMAN BATTEN.**  
ALTHO BADLY BURNED CLAMBERED UP ON THE HOOD AND STEERED HIS BLAZING CAR OFF THE TRACK DURING THE INDIANAPOLIS RACE 1929. (He was awarded a special Prize for Bravery.)

Write us if you know an oddity

## The NEWS TRAILER

Artisans in fabrics, mosaics and metals have copied the design of the peacock's tail, but it was left to Goodrich to ingrain its ocellated plumage into a tire sidewall—and in any color scheme, too!

Cruising speed, 155 m.p.h. . . . top speed, 175 m.p.h. . . . ten passengers . . . 400 lb. mail and express . . . two pilots . . . two engines . . . low-wing, all-metal monoplanes. Twenty of these are being built by Boeing for United Air Lines.

Oldsmobile, Aug. 21, 1897. That puts the G. M. car at the head of the list of "living old-timers," a part of the announcement of the car's birthday points out.

A simple speed detector, to obtain a large number of highway speed readings, has been introduced into Connecticut. The state is trying to determine what constitutes "reasonable speed."

The 'oss is on 'is last legs in good old "Lunnon." Busiest streets in downtown London will be re-

stricted to motor vehicles, and the circle extended until old Dobbin will have to go back to the farm.

The Kansas reformatory has gone crooked. Inmates have been making duplicate sets of license tags in the state factory, and have been smuggling them out to paroled, freed and trusty prisoners for sale to all and sundry—at a cut rate.

John Bonbright, publicity director for Graham-Paige, once more sails for Europe this month—this time at the expense of John Wanamaker store in New York.

John says it was easy for him to win the contest for Silver King golf balls—all he had to do was to combine some of the spare adjectives he keeps on file for describing the Graham eights and sixes.

Construction is to begin soon on a new 26-mile, \$500,000 highway connecting Hamilton, Ontario, with the Peace Bridge at Fort Erie.

# NEWS

## July Sales Down 25%

**Polk Estimate Shows  
Drop as 22 States  
Report 36,283 Units**

DETROIT, MICH., Aug. 15—Registrations of new passenger automobiles in 22 states, representing 34.89 per cent of the entire country, during July fell off 25.45 per cent from June registrations in the same states, according to R. L. Polk & Co.

July registrations in those states reached 36,283 units, as compared to June registrations of 48,677 units, in the same states. The current July registrations represent a 46.48 per cent decline under registrations of 67,802 units in July a year ago, in the same states.

An estimate based on the 22 states, points to a total registration during July of 104,000 units.

Registrations of new commercial cars during July in 23 states, representing 38.21 per cent of the country, reached 5362 units, a decrease of 9.43 per cent under June registrations of 5920 units, and a decline of 53.37 per cent under registrations of 11,502 units in July a year ago, in the same states.

The Polk Co. estimates total truck registrations during July at 14,000 units.

## Thompson to Make Valves for G. M.

**Purchase of Muncie Plant  
Leads to Huge Contract**

CLEVELAND, Aug. 16—Thompson Products, Inc., reports it will manufacture all valves used in General Motors Corp. products, as the result of an arrangement in which Thompson Products purchased General Motors' valve plant and equipment at Muncie, Ind., as announced in *Automotive Industries* Aug. 6.

Immediate concentration of production will be undertaken, removal of the Muncie plant to Cleveland being a part of the plans. Thompson Prod-

ucts, which has shared a large portion of General Motors business for a number of years, will add several hundred employees to its present payroll of 1500, in order to handle the production of several million dollars worth of valves per year.

## Willys Gets Note Extensions, Report

**\$1,000,000 Sinking Fund  
Requirement Deferred;  
Position is Improved**

TOLEDO, Aug. 16—Moves to better the financial position of Willys-Overland Co. have been making further progress since the return of John N. Willys, chairman, to active participation in the company's affairs.

Mr. Willys now holds voting control of the company through ownership of majority of preferred stock, whose provisions vest sole voting rights in this issue after four quarterly preferred dividends are in arrears.

Since his return in the latter part of June he has been concentrating his efforts particularly on improving the company's financial position.

Along these lines the cooperation of some of the company's principal parts and material suppliers has been procured in extending bills now payable for one year. After this arrangement, the company's cash balance is now larger than the remaining accounts past due at the end of July.

In addition, the company will defer the regular sinking fund requirement of \$1,000,000 due on its first mortgage 6½ per cent bonds, of which \$2,000,000 are now outstanding.

At a later date arrangements will be attempted to take care of this issue at maturity on Sept. 1, 1933.

Aside from financial problems, Mr. Willys and the management are making intensive efforts to continue reductions in operating and production costs.

Substantial progress has already been made in this direction, and further adjustments are in prospect to bring the company's costs to a level in line with the volume of business obtainable under current conditions.

## Business in Brief

**Written by the Guaranty Trust  
Co., New York, exclusively for  
Automotive Industries**

NEW YORK, Aug. 16—There was little or no material improvement in the actual level of trade and industrial activity last week, but on all sides there were signs of a growing confidence. Improvement in the stock, bond, and commodity markets continued, despite moderate reactions.

### RAIL LOADINGS UP

Railway freight loadings during the week ended July 30 totaled 510,687 cars, which marks an increase of 9557 cars above those during the preceding week, but a decrease of 251,131 cars below those a year ago and a decrease of 409,094 cars below those two years ago.

### ELECTRIC PRODUCTION OFF

Production of electricity by the electric light and power industry in the United States during the week ended Aug. 6 was 13.1 per cent below that a year ago.

### LUMBER ORDERS GAIN

Although the production of lumber during the week ended Aug. 6 continued at the lowest level in several years, new orders amounted to only 11 per cent above the cut, while shipments were 1 per cent above.

### WHEAT HARVEST OFF

Production of winter wheat, according to the Aug. 1 report of the United States Department of Agriculture, is now placed at 442,000,000 bushels, as against a harvest of 789,000,000 bushels last year. Spring wheat is placed at 281,000,000 bushels, as against 104,000,000 bushels harvested last year.

### CRUDE OIL PRODUCTION UP

Average daily crude oil production for the week ended Aug. 6 amounted to 2,171,900 barrels, as against 2,137,500 barrels for the week before and 2,555,550 barrels a year ago.

### CONSTRUCTION GAINING

Construction contracts awarded during July, according to the F. W. Dodge Corporation, amounted to \$128,768,700, as against \$113,075,000 during June and \$285,997,300 a year ago.

### FISHER'S INDEX STILL GAINING

Professor Fisher's index of wholesale commodity prices during the week ended Aug. 13 stood at 61.9, as against 61.1 the week before and 60.9 two weeks before.

### BANK DEBITS DOWN

Bank debits to individual accounts outside of New York City during the week ended Aug. 10 were 33 per cent below those a year ago.

### FEDERAL RESERVE BANKS

The consolidated statement of the Federal Reserve banks for the week ended Aug. 10 showed decreases of \$35,000,000 in holdings of discounted bills and of \$2,000,000 in holdings of bills bought in the open market. Holdings of Government securities increased \$5,000,000. The reserve ratio on August 10 was 57.9 per cent, as against 57.2 per cent a week earlier and 56.5 per cent two weeks earlier.



## Death Breaks Life-long Triad of Triumphant Graham Brothers

WASHINGTON, IND., Aug. 16—This little county seat town was closed today as its citizens paid final respect to Ray A. Graham, youngest of the Graham brothers of automotive fame.

Civic worker, philanthropist and prince of friends, "R. A.'s" sudden drowning in Chatham, Ont., Saturday, cut deeply across the heart of this community where he and his brothers started on their brilliant careers.

It was here that they established industrial plants and banks. They came here often to rest amid the scenes of their boyhood, when the partnership of the three brothers was begun.

Requiem High Mass was sung in St. Simon's church, as many automotive and industrial leaders of the nation joined with relatives and townsfolk in mourning his death, which resulted from a relapse of a serious nervous breakdown.

Beside his brothers, Joseph B. and Robert C., Mr. Graham is survived by his widow and Laura Margaret, Ray Winston, John Philip and Barbara Ann, their children.

Mr. Graham, who was 45, was credited with being the mechanical genius whose inventive abilities were responsible for first getting them into the motor-truck business.

Graduating from the University of Illinois in 1908, following a course at St. Mary's College, Kansas, Mr. Graham undertook the management of the Graham farm properties, near Washington.

He was credited with being the mechanical genius who brought his brothers into the motor truck business. He became interested in this field, visioning the need for a lightweight motor truck, and invented a rear axle with a spliced frame whereby Ford cars could be utilized as trucks.

His father and brother, Joseph B., had established a small glass factory in 1901 after the discovery of natural gas in the vicinity.

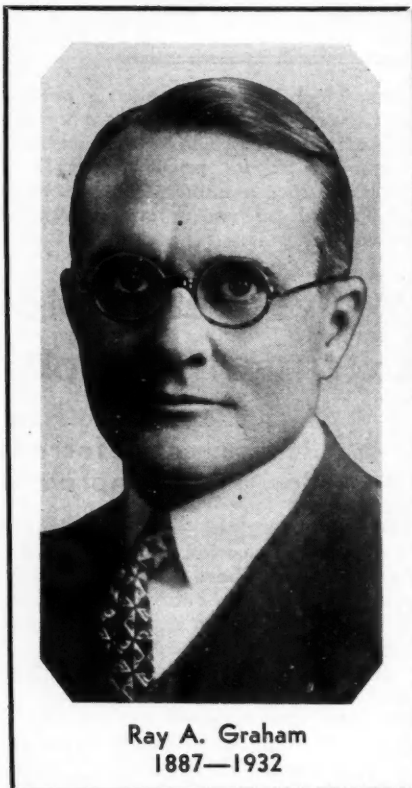
The business grew and eventually was merged with the Owens Bottle Co., of Toledo, and the brothers found themselves out of a job.

The development of the axle caused the brothers to open a factory in Evansville to build cab and body for the truck and thus the Graham truck was conceived.

In 1921, they entered into a contract with John F. and Horace E. Dodge to build trucks and established their plant in Detroit. Ray Graham became manager, Robert became director of sales and Joseph remained in Evansville to handle the body plant.

In November, 1925, when the Graham truck became a unit of Dodge Bros., Inc., the Graham brothers be-

came executives of the Dodge organization. Six months later they sold their 49 per cent of the stock and a year later they acquired the Paige corporation.



Ray A. Graham  
1887—1932

By increasing the size of their Evansville plant and purchasing the Wayne Body Co., at Wayne, the brothers were equipped to take care of 90 per cent of their own body requirements. They became pioneers in the building of motor buses and sold Detroit the first 140 buses used to augment trolley service.

The Graham brothers were feted by Evansville citizens in a civic celebration in November, 1928, when their new \$1,500,000 plant was completed.

He was a member of the Detroit Athletic Club, Detroit Yacht Club, the Union League of Chicago and many New York clubs.

In 1922 he was honored by the Pope with the Order of the Knighthood of St. Gregory.

### Oehrli Resigns

John W. Oehrli, after 8 years association with the Lycoming Mfg. Co., has resigned his position as asst. chief engineer in the automotive engine division to devote the coming year to research and graduate study in the Sheffield School, Yale.

## Organizes Fight Against Taxes

### Massachusetts Motor Groups Form Highway League to Reduce Levies

by J. T. Sullivan

BOSTON, Aug. 15—The Highway Taxpayers League just organized here to curb excessive taxation on the motor industry will be made statewide in the next few weeks.

On its rolls are men affiliated with owning, making, selling and servicing motor vehicles and accessories; contractors, bonding and fuel companies, cement, steel, pipe, explosive and other units used in highway work.

Its first effort will be to oppose the plan of Massachusetts Mayors who now seek to have a bond issue of \$15,000,000 authorized by the legislature for city and town welfare work, the money to come from the automobile funds paid by motorists in the next three or five years.

Also it will canvass men nominated for the legislature this fall to learn their attitude on motor taxation. A committee representing Boston, Worcester, Leominster, and Springfield was named to draft organization plans and nominate other officers from various cities and towns, after a permanent headquarters will be opened in Boston.

The committee comprises Day Baker, Secretary of Motor Truck Club of Massachusetts; Manager Harry A. Stoddard, Boston Automobile Club; Joseph A. Tomasello, Boston contractor; C. A. Montague and Russell Harmon of Worcester; Albert T. Rhodes of Leominster, and John H. Smith of Springfield.

### Stoller to Resign From General Tire

John G. Stoller, secretary of the General Tire & Rubber Co., will resign, effective the latter part of this month, it was revealed at company offices. Mr. Stoller came to Akron from Kansas City in 1915 when the company was formed.

He was in charge of all purchases, having held that position since 1917. He was made secretary in December, 1929.

Robert M. Graham, associated with the company for some time, recently as chief efficiency engineer, will assume the duties of general purchasing agent.

### Asks Building Bids

DETROIT, Aug. 15—Argonaut Realty Corp., subsidiary of G. M. Corp., is taking bids for an addition to the laboratory building of the Ethyl Gasoline Corp. in Detroit.



## Brake-lining Cut in Lengths is Ruled Taxable, But Non-Taxable if in Rolls

WASHINGTON, Aug. 17—Brake lining sold in rolls is not taxable, but when cut to length to fit certain cars it is taxable.

Informal ruling to this effect was announced yesterday by the Bureau of the Internal Revenue. It was made in response to a request made upon the Bureau to advise whether the excise tax imposed in the new revenue act on automobile parts and accessories applies to brake lining in rolls or whether it applies only on such brake lining as is cut to length, and possibly packed especially for certain cars.

Another informal ruling held that stocks of gasoline held by dealers, jobbers, etc., on the effective date of the law, June 21, are not taxable. The Bureau made the ruling in reply to an inquiry as to whether taxes imposed on inventory of gasoline held by chain stations are to be computed on the total amount at all the stations or whether they are to be computed on the stock held by each station individually.

It was pointed out by the Bureau that Sec. 617 (E) (i) of the new law provides that "the term 'producer' includes a refiner, compounder, or blender and a dealer selling gasoline exclusively to producers of gasoline as well as a producer.

"It is held," the ruling said, "that all sales of gasoline by a person qualifying as a producer are taxable regardless of when or how the gasoline was produced or acquired."

The Bureau also announced that gasoline purchased by municipal corporations is not taxable if it is sold direct by the manufacturer to state or political subdivisions for use in the exercise of an essential governmental function provided the purchases are paid for out of the state or municipal treasury. If the articles, except firearms and ammunition, are sold

through a jobber or intermediary, however, the tax applies even though the manufacturer has knowledge that the articles are destined for ultimate use by a state or political subdivision.

Returns covering taxes on gasoline and lubricating oil must be made solely on a calendar month basis. The Bureau made this ruling in denying the request of an inquirer for permission to file returns on gasoline and lubricating oil on a fiscal month basis.

Another ruling said that lubricating oil may not be sold tax free in accordance with the provisions of Sec. 620 of the new act unless the oil is sold for use as a material in the manufacture or production of or for use as a component part of a taxable article to be manufactured or produced by the vendee.

"Lubricating oil sold to manufacturers of automobile bodies and chassis to be used in the operation of machinery or for other lubricating purposes may not be sold tax free under the provisions of Sec. 620," it was declared.

These findings were made in answer to a request for a ruling relative to the application of the tax on lubricating oil imposed under the provisions of Sec. 601 (c) (i).

The questions presented follow:

"The H company sells lubricating oil to certain manufacturers of automobiles and bodies, which are taxable articles. (1) Is such oil used by the manufacturers on their own machinery taxable? (2) Is such oil placed in and sold with such taxable articles itself taxable under Sec. 620?"

Replying to another query, the Bureau ruled that ball bearings and roller bearings, except when sold on an automobile or automobile truck, are not subject to tax. It was likewise held that battery hydrometers and battery fillers are not subject to tax under Sec. 606 (c) of the new law.

## Steel Men Again Await Car Orders

### Automotive Demand Will Turn Tide, Mills Hold, Pending Upturn

NEW YORK, Aug. 18—Not much in the way of an upturn in operations of rolling mills is looked for until automotive consumers once again pull the steel market out of its rut.

Demand from other sources is slow in materializing. The steel industry as a whole lives in hopes that it will be operating at a more normal rate during the second half of September, but revival of the sheet and strip market depends almost wholly on resumption of buying by the tonnage consumers in the passenger motor car field.

Scattering orders from warehousemen and jobbers for sheets and wire products were recorded this week, indicating that stocks in the hands of these distributors have dwindled as much as have those held by consumers who buy direct from mills.

There is a good deal of talk about lower prices for sheets. Undoubtedly attractive specifications, sufficient in tonnage to enable this or that mill to keep its wheels turning until demand generally shows signs of broadening, can be placed at prices sharply under those generally quoted.

Conditions being what they are, the market for some time has been more or less nominal, and each order virtually carries its own price. On the whole, however, the steel market is rounding out its period of greatest inactivity in fairly good shape, prices for hot and cold-finished steel bars, automotive alloy steels and manufacturers' wire holding up very well.

Strip steel manufacturers complain more of the paucity of orders than of prices in vogue. Makers of bolts and nuts sing much the same song.

**Pig Iron**—While there is more activity in most of the markets, demand from automotive foundries is in abeyance. It is in the pig iron market that the first effect of a resumption of buying of equipment by railroads is making itself felt. Prices are unchanged, but the tone of the market is a shade stronger.

**Aluminum**—Pending revival of demand, the domestic producer is reported to have suspended operations at a number of plants. The present month is proving the lightest in point of aluminum buying by automotive consumers. The market remains unchanged.

**Copper**—The market is holding its previous gains with electrolytic held rather firmly at 5% @ 5½ cents, delivered Connecticut.

**Tin**—The upward movement in this metal continues, the market for Straits being quoted at 23.20 cents at the beginning of the week. Consumers are showing better interest.

**Lead**—Unchanged and steady.

**Zinc**—Quiet and firmer.

### Rufus Grieve

Rufus Grieve, 51 years old, superintendent of the Flint Foundry, died Aug. 13 at his home in Flint, Mich.

## Goodyear Shows \$50,509 Profits for First Half

### Six Cents a Share After Depreciation, Taxes and Markdowns

CLEVELAND, Aug. 16—Goodyear Tire & Rubber Co. reports for six months ended June 30, 1932, consolidated net profit of \$50,509 after depreciation, interest, federal taxes and mark-down to market prices of raw material and raw material content of finished goods, etc.

This is equivalent to 6 cents a share on 762,023 no-par shares of \$7 preferred stock and compares with net profit of \$4,221,770, equal, after preferred dividend requirements, to \$1.06 a share on 1,435,137 no-par common shares in first half of 1931.

Net sales for first six months of this

year were \$68,953,780 comparing with \$83,228,661 in the first half of 1931.

Total assets on June 30, 1932, amounted to \$206,467,276 compared with \$207,362,693 on December 31 last, and \$223,927,530 on June 30, 1931.

Current assets were \$104,062,876 and current liabilities were \$11,938,497 compared with \$98,954,632 and \$9,694,773 respectively on Dec. 31, last, and \$115,998,246 and \$14,586,028 at the end of June, 1931.

Cash and Canadian and U. S. Government securities on June 30 were \$41,797,727 against \$37,612,922 on Dec. 31, 1931.

AKRON, Aug. 15—Goodyear Tire & Rubber Co. has declared the regular quarterly dividend of \$1.75 on the preferred stock, payable Oct. 1 to stock of record Sept. 1.

## Railroads May Use Trucking Service

**"Door-to-Door" Delivery Approved, Truckers Losing Injunction Plea**

PHILADELPHIA, Aug. 18—In a far-reaching decision, Federal Judge George E. Welsh yesterday cleared the path for inauguration of full motor trucking "door-to-door" freight service by the Pennsylvania Railroad and all other roads that so desire.

His decision held that such service would not constitute "extension of lines."

The ruling may be a death blow to terminal companies. Four of them, representing \$20,000,000 investment in Brooklyn, and backed by other companies with \$200,000,000 invested, had sought an injunction against the Pennsylvania's plan.

Technically, Judge Welsh's decision left the matter entirely up to the Interstate Commerce Commission. But that was enough, for the commission, in a similar case, has ruled in favor of the railroads.

The Pennsylvania Railroad was all ready to go ahead with the new service when the decision came. Full plans had been laid long before the restraining suit had been filed.

Sept. 15 has been set for inaugurating the service.

All that remains is for the Interstate Commerce Commission to approve the rate schedule.

Under the new service, trucks owned and operated by the railroad will pick up goods at the factory or store of the shipper, and deliver them by truck to the door of the receiver.

Heretofore, shippers had to use their own trucks or depend on terminal companies, and the same held true for the recipients of the goods.

The decision means potential millions in additional revenue to the railroads, and railroad men looked upon yesterday's decision as one of the most important legal victories in railroad history.

Though the ruling directly affects service in the New York metropolitan area only, it is a precedent which, railroad officials declared, will certainly be followed throughout the country.

## Federal Truck Lists Assets at \$4,954,722

DETROIT, Aug. 17—Federal Motor Truck Co. as of June 30, shows total assets of \$4,954,722, compared with \$5,989,382, on June 30 of last year.

Surplus is \$1,995,184 against \$2,891,846.

Current assets include \$898,504 in cash and marketable securities, and totaled \$3,160,154, as against current liabilities of \$253,360.

## Automotive Employment Shows Further Decline

DETROIT, Aug. 17—Automotive employment in Michigan for July, according to figures released by State Department of Labor and Industry, show a decline of 1 per cent from June both in number of employees and weekly payroll.

Compared with last July employment is off 10 per cent and payroll about 11 per cent. Average weekly earnings show little change with \$23.19 as against \$23.16 in June and \$23.38 last July.

Average weekly earnings continue higher in the automotive than all other industries with the exception of paper and printing and chemicals. Total for all industries shows a 17 per cent decline in payroll and 11 per cent in employment, compared with last July.

## Kelton-Aurand Head is Named Receiver

BAY CITY, MICH., Aug. 17—Albert L. Harris, vice-president and general manager of the Kelton-Aurand Mfg. Co., makers of reed furniture and seats for buses, coaches and airplanes, has been appointed temporary receiver for the firm, following a filing in Bay City Circuit Court of a petition for dissolution of the company by its directors.

## Omits Quarterly Dividend

MUSKEGON, MICH., Aug. 17—Muskegon Motor Specialties Co. has omitted the 50-cent quarterly dividend due at this time on its Class A stock.

## Du Pont Dividend Again Reduced

**Directors Put Common Stock on Annual Basis of \$2 a Share, from \$3**

NEW YORK, Aug. 16—Directors of E. I. du Pont de Nemours & Co. voted yesterday the second reduction in the dividend on the common stock this year, establishing the new rate at \$2 annually. This rate, 50 cents quarterly, has been expected generally in the financial community and had little effect on the stock, which closed with a net gain of 2½ points for the day.

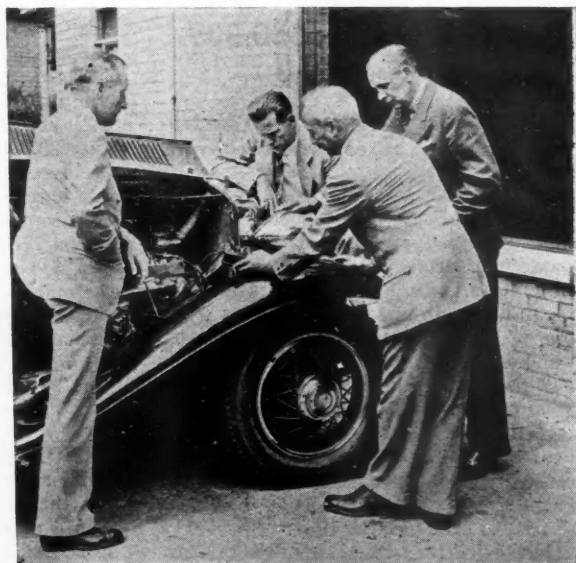
At the board's meeting last spring the dividend was reduced to 75 cents quarterly, or \$3 annually. Previous to that time the common stock had paid \$1 quarterly, or \$4 annually. The new dividend is payable on Sept. 15 to stockholders of record on Aug. 24.

The directors voted also to pay the regular quarterly dividend of \$1.50 a share on the debenture stock on Oct. 25 to holders of record on Oct. 10.

The combination of the reports of the General Motors Corp., from which du Pont receives large revenue, and that of the du Pont company itself for the second quarter of this year, had presaged yesterday's dividend action. The du Pont report showed that its earnings, exclusive of income from General Motors, was only between 3 and 4 cents a share, while General Motors' report showed earnings below the company's dividend requirements.

## AC Overseas Executives See Rabezzana's Ignition Tester

Left to right—Harlow H. Curtice, president and general manager, AC Spark Plug Co.; Louis P. Michaud, head of AC plant in France; Norman F. Stockbridge, managing director of AC plant in England, and Hector Rabezzana, chief spark plug engineer. Mr. Rabezzana is demonstrating a new device that tests spark plugs and other parts of the automobile's ignition system without removal from the motor





## Gain of 30% Shown in Air Passengers Carried Over U. S. Lines in Half Year

NEW YORK, Aug. 16—Passengers carried on air transport lines during the first six months of 1932 totaled 223,834, according to a report issued by the Aeronautical Chamber of Commerce of America, Inc.

This represents an increase of nearly 30 per cent as compared with the first half of 1931, when 176,143 passengers were carried. A total of 26,035,920 miles were scheduled and 23,633,036 miles flown during the first six months of 1932, an increase of approximately 30 per cent as compared with the same period in 1931 when 19,118,857 miles were scheduled and 18,242,475 miles flown.

Air mail poundage in 1932 ran between 4 and 5 per cent less than 1931 up to June 1. The month of June brought the total for the first half to 4,232,767 pounds or 6.4 per cent under the amount carried during the same period last year.

Air express poundage totaling 668,250 was reported during the first six

months of this year, an increase of 72 per cent as compared with the same period of 1931.

Unlike other years, mileage flown, which reached a total of 4,137,000 miles in March, has remained at practically that same level each succeeding month. No new lines have opened operations and extension of routes and schedules has been offset by consolidations. This makes the steady increase in passenger and express volume more significant.

An average of 37,305 passengers were carried each month, but June traffic totaling 47,573 passengers exceeded the average by more than 10,000.

According to figures received in June report, the air lines now employ a total of 6444 persons. The total is broken down as follows: 11 per cent pilots, 32 per cent mechanics and riggers, 8 per cent traffic solicitors, office workers 21 per cent, and unskilled labor 28 per cent.

## Splitdorf Co. Will Dissolve

### Edison-Splitdorf Will Buy Certain Assets of Electric Concern

NEWARK, N. J., Aug. 16—Stockholders of the Splitdorf Electrical Co. voted to dissolve the company and to sell part of its assets to the Edison-Splitdorf Corp.

Each holder of \$100 par value of Splitdorf debentures will receive two shares of no-par value common stock of Edison-Splitdorf and the right to purchase five more shares at \$5 cash.

Each holder of 20 shares of Splitdorf common stock will receive one share of Edison-Splitdorf common and the right to purchase three more shares at \$5 cash.

The board of directors recommended the dissolution to end large losses of the last seven years and to conserve assets for stockholders and creditors. The Splitdorf Co. was founded in New York in 1858 and moved here in 1912.

Charles Edison, son of the late Thomas A. Edison, is president of the Edison-Splitdorf Corp., which will pay \$197,000 for the equipment and inventory of the plants of the dissolved company here and in Bethlehem, Pa., and for its name, patents, trademarks, copyrights, records, contracts and distributing agreements.

## Trailer Fees Up; Other Automotive Units Decline

### Michigan Total Registrations Show Cars Off \$1,000,000

LANSING, MICH., Aug. 17—Fees collected from trailer permits increased more than \$32,000 for the first four months of this year, in Michigan, compared with the same period last year, representing a 10 per cent increase in trailer registrations.

Passenger car registrations declined approximately \$1,000,000.

Truck registrations also showed a decline, the total as of May 1 being 103,138, compared with 122,589 May 1 of last year.

Motorcycle registrations showed a drop from 1882 to 1465.

Registration fees for passenger cars totaled \$12,071,977 as compared with \$13,186,091 last year when a total of 923,911 cars were registered in the first four months.

## Wayne Sales Jump

DETROIT, Aug. 16—New car sales in the Detroit area took a jump during the first ten days of August, possibly largely on account of the availability of new car licenses for 1932 at one-half price which became effective Aug. 1. Wayne county sales for the first week in August totaled 713 cars as against 451 the preceding week.

## Ask Rail Rate Inquiry

GRAND RAPIDS, MICH., Aug. 17—Investigation of rail freight rates in

Michigan has been asked in a petition filed with state public utilities commission by Leo Golden, executive director of the Michigan Rail Traffic Alliance. The petition contends that higher rates are charged north of Bay City and Muskegon.

## N.S.P.A. Sponsoring Five One-Day Jobber Meets

DETROIT, Aug. 12—A series of five one-day jobber conferences will be sponsored during October by the National Standard Parts Association. These conferences will be held at hotels to be announced, in the following cities: Pittsburgh, Oct. 4; Detroit, Oct. 6; Dallas, Oct. 11; Kansas City, Oct. 13; Chicago, Rockford or Milwaukee, Oct. 18.

Details as to program subjects are being handled by local jobber committees in each city, and invitations are being extended to all jobbers regardless of association affiliations.

Recommendations from the N.S.P.A. are that the morning sessions be devoted entirely to problems of internal management, including inventory analysis, effects of discounts granted, analysis of customer purchases, collections, obsolescence and warehousing. Afternoon sessions, it is recommended be devoted to external problems, including those pertaining to car manufacturers, parts manufacturers, fleet owners, selling retail at list prices, etc. It is estimated approximately 1000 jobbers will attend the meetings.

## Court Denies Receiver

JERSEY CITY, N. J., Aug. 16—Vice Chancellor John O. Bigelow refused the application of stockholders of the Splitdorf Electrical Co. of Newark for the appointment of a receiver for the company. At the same time, the vice chancellor said he would appoint a master in chancery to investigate the proposed sale of assets to the Edison-Splitdorf Co. Meanwhile, he decreed that the directors of the Splitdorf Electrical Co. act as trustees in liquidation.

The Edison-Splitdorf Co., according to the plan agreed on, was to buy the assets of the Splitdorf Electrical Co. for \$197,000. The stockholders who asked for the appointment of a receiver objected to the sale on the ground that the amount to be paid was not adequate.

## Newton Steel Reports Loss

DETROIT, Aug. 16—Newton Steel Co. for first of 1932 reports net loss of \$346,943, compared with net loss of \$198,038 for the first half of 1931.

## Rockne Reports Shipments

DETROIT, Aug. 17—Rockne Motors reports shipments to date of Rockne cars aggregating better than 18,000 units.



## 722 Aircraft Built in U. S.

**Report of First Half  
Shows Over 50%  
Were Exported**

WASHINGTON, Aug. 16—Airplanes manufactured in the United States during the first six months of 1932 totaled 722, of which 351 were for domestic civil use, it was announced today by Col. Clarence M. Young, assistant secretary of commerce for aeronautics.

The 351 airplanes built for civil use in this country during the period Jan. 1 to June 30 included 264 monoplanes, 71 biplanes and 16 autogiros. Of the monoplanes, the majority were landplanes of the one, two or three-place open cockpit type, and of the biplanes the majority were one to five-place open cockpit landplanes.

Of the airplanes produced from Jan. 1 to June 30, 1932, the total of 722 was divided as follows: 351 for domestic civil use, 325 for military delivery and 46, including civil and military, for delivery to purchasers in foreign countries.

The report is based on a record of Department of Commerce licenses, identification marks issued for unlicensed airplanes, and reports as to military and export production for aircraft manufactured between Jan. 1 and June 30. There is a possibility, however, that there still may be a few aircraft manufactured within that period for which licenses or identification marks have not yet been sought.

## Thermoid Reports \$80,000 Net Loss

NEW YORK, Aug. 16—Thermoid Co. and wholly owned subsidiaries report for six months ended June 30, 1932, net loss of \$80,970 after depreciation, interest, etc. This compares with profit before federal taxes of \$70,048 in first half of 1931.

For quarter ended June 30, 1932, net profit was \$25,716 after depreciation, interest, etc.

Net loss of Southern Asbestos Co. (a 95 per cent owned subsidiary) for six months ended June 30, 1932, was \$7,248 after charges and depreciation, against net profit of \$8,993 in first six months of 1931.

## Finds Business Better

DETROIT, Aug. 16—Improved buying conditions, general over the whole country, are reported by Graham-Paige Motors Corp., based on dealers' returns showing that retail deliveries during the first week of August exceeded any week of last month.

"Indications are that August sales will exceed July by one-third," says C. W. Matheson, general sales manager. "We have increased our pro-

duction schedule so as to build 50 per cent more cars than originally planned for the current month, and are now placing orders with our suppliers for a substantially increased volume of material for our September production, which, it is now estimated, will exceed August.

"Reports received from our dealers indicate that the improved demand is general over the country."

## Sees Northwest Ready to Lead Business Upswing

MINNEAPOLIS, Aug. 16—At a sales promotion meeting here of Buick, Pontiac, and Oldsmobile dealers the fact was emphasized that with automobile values at a peak, savings deposits high and inventories low, the automobile is to bring the Northwest back to better times.

O. L. Waller, zone manager, assisted in the demonstrations by special equipment with Sales Promotion Manager W. R. Huber and Assistant General Sales Manager Courtney Johnson.

The 450 dealers and salesmen were all optimistic, feeling that the tide has turned up in the light of the fine crop situation. "The Northwest, I believe, will be one of the first sections of the country to start the buying movement," said Mr. Johnson, "and the movement seems already to have begun."

## Crude Rubber Use is Down

NEW YORK, Aug. 16—Consumption of crude rubber by manufacturers in the United States for the month of July amounted to 28,272 long tons as compared with 39,116 long tons for June, 1932, and represents a decrease of 27.7 per cent, according to statistics released by the Rubber Manufacturers Association today.

Imports of crude rubber for the month of July were 31,078 long tons, a decrease of 24.9 per cent below June 1932, and 24 per cent below July a year ago.

Total domestic stocks of crude rubber on hand July 31 were 346,335 long tons, which compares with June 30 stocks of 345,702. July stocks show practically no percentage change as compared with June of this year, but were 47.5 per cent above the stocks of July 31, 1931.

The participants in the statistical compilation report 37,894 long tons of crude rubber afloat for the United States ports on July 31. This compares with 43,079 long tons afloat on June 30, 1932, and 50,155 long tons afloat on July 31, 1931.

## Ford Plant Continues

ST. PAUL, Aug. 16—The Twin-City plant of the Ford Motor Co. continues in operation with about 1000 men. This is an assembly and glass manufacturing plant. Half the force is on full time and half on a 4-day week.

## McQuay-Norris Co. Earns \$1.84 a Share

**Like Period, 1931, Showed  
\$2.44 Earnings, Report Says**

CHICAGO, Aug. 15—For the six months period ended June 30, 1932, the net profits of the McQuay-Norris Mfg. Co. were \$210,450, equivalent to \$1.84 per share on the 114,349 shares outstanding, according to a statement issued by W. K. Norris, president. These profits were after full allowance for Federal and State taxes, depreciation, obsolescence, and all other charges. For the corresponding period of 1931 the earnings were \$284,546, equivalent to \$2.44 on the 116,615 shares then outstanding.

In his statement Mr. Norris said: "It is particularly gratifying to have been able to earn our full dividends for the period with an excess margin of approximately 22½ per cent in a period that was undoubtedly the most trying in the almost three years of severe depression.

"The company's financial position continues to be extraordinarily sound, with a ratio of current assets to liabilities of better than 10 to 1. Your company has no bank loans, no bonded indebtedness, and no liabilities of any kind except current accounts payable of very nominal proportions. The company has approximately \$1,000,000 in cash and bonds—mostly United States Government.

"It is, of course, extremely difficult in a period like this to make any prediction of the earnings for the last half of 1932. We feel that we have demonstrated an earning power in the severest kind of depression, and that any betterment in general business will be immediately reflected in our volume and profits.

"Our trade position was never more secure. We have made considerable progress in the establishment of additional desirable customers, which is bound to reflect itself in the future earning power of this company."

## Continental Diamond Fibre Reports Loss

NEWARK, DEL., Aug. 16—Statement of Continental Diamond Fibre Co., including foreign subsidiaries, for quarter ended June 30, 1932, shows net loss of \$159,487 after depreciation, etc., comparing with net loss of \$162,374 in preceding quarter. In June quarter of previous year, company reported net loss, excluding foreign subsidiaries, of \$27,604.

For six months ended June 30, 1932, net loss, including foreign subsidiaries, was \$321,861 after depreciation, etc. In the first half of 1931, company reported net loss of \$57,228, including profit from foreign subsidiaries for March quarter only.

Net current assets on June 30, last, amounted to approximately \$3,156,000 of which \$1,132,000 represented cash and marketable securities.

# Timken-Detroit Axle Co. Reports Gain in Total Assets as of June 30, 1932

DETROIT, Aug. 16—Consolidated balance sheet of Timken-Detroit Axle Co. and subsidiaries as of June 30, 1932, shows total assets of \$17,700,932 comparing with \$17,400,512 on June 30, 1931, and surplus of \$3,072,426 against \$3,497,213.

Current assets including \$2,241,155 cash and marketable securities, amounted to \$7,603,553 and current liabilities were \$467,965 comparing

with cash and marketable securities of \$3,108,374, current assets of \$8,472,135 and current liabilities of \$752,630 on June 30, 1931.

Capital stock consists of 27,756 shares (par \$100) of 7 per cent cumulative preferred stock and 992,096 shares (par (\$10) of common stock.

Consolidated income account of Timken-Detroit Axle Co. for six months ended June 30, 1932:

	1932	1931	1930	1929
Gross profit .....	\$1,177,878	\$1,180,176	\$2,093,264	\$2,290,127
Cost and exp. ....	1,520,365	1,070,942	1,074,237	1,082,853
Operating loss .....	\$342,487	†\$109,234	†\$1,019,027	†\$1,207,274
Other income .....	58,982	53,691	62,669	155,455
Loss .....	\$283,505	†\$162,925	†\$1,081,696	†\$1,362,729
Depreciation, etc. ....	\$506,344	\$430,702	\$315,350	\$344,475
Interest .....	30,595	.....	.....	.....
Taxes .....	.....	7,400	*110,919	*137,546
Net loss .....	\$820,444	\$275,177	†\$655,427	†\$880,708

\* Includes federal taxes. † Profit.

# Soviet Motor Output Lower

Production is Below 5-Year-Plan Quota, Although Shows Gain

LONDON (Special)—Russian production of motor vehicles has continued to increase during 1932, although still falling considerably below the quota set in the five-year plan.

The output of automobiles in the first six months this year advanced 17 per cent over 1931, while tractor production was almost four times larger than last year.

These gains followed substantial increases during 1930 and 1931. The table below gives the total number of vehicles produced in the U. S. S. R. in the last three years:

Year	Output	Per Cent Increase
1931.....	23,400	174
1930.....	8,500	78
1929.....	5,000	..

Soviet statistics covering the first six months of 1930, 1931 and 1932 show that the largest increase has come in the number of tractors built.

First 6 Months	Autos	Tractors
1932.....	9,127	21,018
1931.....	7,769	5,724
1930.....	2,448	....

Russia has two tractor plants now working, one at Stalingrad, the other at Kharkov. During the first six months of 1932 the first was responsible for 13,525 units, against 17,612 proposed under the five-year plan, while the Kharkov plant manufactured 7493 tractors instead of 8696, as called for.

On the other hand, motor car production during the first six months of 1932 was principally due to the Staline plant, which turned out 6190 automobiles, or 84.21 per cent of that scheduled, and the Nijni works, which manufactured 1223, or 32.47 per cent of that planned. Of two smaller plants, the Jaroslavl produced 748 (part of which were not complete), and the Kim, 738 trucks and 225 autos.

The failure of these factories to live up to their schedule is attributed to difficulties in procuring sufficient supplies of raw materials.

# Spring Perch Co. Moves Factory

LACKAWANNA, N.Y., Aug. 16—The Spring Perch Co., one of the oldest suppliers in the automobile industry, has recently completed the removal of its entire plant from Bridgeport, Conn.

The company began business in 1843 in Bridgeport as a manufacturer of carriage springs and carriage hardware and is thought to be the first supplier of springs for the automobile trade.

John C. Hawley is president, and H. C. Dow is chief engineer.

# Philadelphia Engineers Register for Employment

PHILADELPHIA, Aug. 16—The non-fee charging employment service, sponsored by the Engineers Club here, is appealing to employers of technical workers.

Almost 1000 technically trained men have filed records of their qualifications. Approximately 37 per cent of those registered are classified as mechanical engineers and 50 per cent are qualified as designers and draftsmen.

A few statistics of the total registration are:

- Trained in U. S. colleges... 78%
- Trained in foreign colleges... 12%
- No college training... 10%
- The age groups are also interesting:
- Under 30 years of age... 35%
- Between 30 and 40... 34%
- Between 40 and 50... 24%
- Over 50... 7%

The percentage in the wage groups seems to bear out the assertion oft-times repeated that their services are undervalued.

- Under \$2,500 a year... 48%
- \$2,500 to \$3,500 a year... 29%
- \$3,500 to \$4,500 a year... 17%
- Over \$5,000 per year... 6%

Approximately one-third of the applicants are members of technical societies.

Sixty-three per cent are married.

Fifty per cent of all new registrations are proportioned between civil and mechanical engineering.

# Nicholas Rommelfanger

Nicholas Rommelfanger, 63 years old, designer of gas electric automobiles and an authority on storage batteries, died on Aug. 14 at his home in Boston after a long illness.

Among several gas electric cars which he constructed on private orders was one for Colonel E. H. R. Green of Round Hill, South Dart-

mouth, son of the late Mrs. Hetty Green.

The vehicle was fitted with a roof of non-shatterable glass. A gas engine propelled an electric generator which supplied power directly to the rear wheels.

Mr. Rommelfanger was a native of Trier, Germany, and came to this country in 1894.

He brought from Germany one of the first large electric storage batteries to be used in the country and for years was regarded as an authority on the construction of batteries.

# Clifford H. Oakley

Clifford H. Oakley, president, Essex Rubber Co., Trenton, N. J., died August 9 in a Philadelphia hospital after a lengthy illness. He was 63 years old. He was stricken ill ten months ago but was able to visit his office at different times.

Mr. Oakley and his brother, Lawrence, founded the Essex Company 25 years ago and the firm grew rapidly in the manufacture of automobile accessories, brake lining and numerous specialties. Mr. Oakley was born in Cleveland, in October, 1869, and was educated in the grammar and technical schools of that city and Ashtabula, Ohio.

Mr. Oakley was a director of the Manufacturers' Association of New Jersey and other concerns, including the American Society of Mechanical Engineers. He is survived by his widow, a son, a daughter and two brothers.

# Inquiry

We have an inquiry for an air cleaner which will satisfactorily handle air at high temperatures, up to 800 deg. F., and should like to hear from manufacturers who could supply such a cleaner.



## Perfect Circle Earns \$152,000 in Half

New Product Will Soon Be Announced

HAGERSTOWN, Ind., Aug. 16—Perfect Circle earnings for the six months period ending June 30, 1932, were \$151,527.24 after all deductions including taxes and depreciation.

This amounts to 93 cents per share on the 162,500 shares of stock outstanding, slightly less than a preliminary report to stockholders indicated.

Final figures for the period disclosed the necessity of a reduction of \$55,493.00 in earnings, due to physical inventory adjustments and accrual of Federal Income Tax at the new rate.

The sale of piston rings for the first half of 1932 to the replacement trade and car manufacturers for new cars were less than the first six months of 1931. This reduction in sales which may be attributed to the present economic situation, has reflected lower earnings for the company.

The company will introduce a new product on or about September 1, to be sold through their present distributing organization.

The product, it is said, fits very nicely with the piston ring business and will possibly do a great deal to increase net profits during the last quarter of this year.

A large advertising campaign has already been decided upon to introduce and promote the sale of this new product.

The cash position of the company is excellent with \$978,571.90 in cash and government securities. This represents an increase of \$142,710.93 in the last twelve months.

## G. M. of Canada Shuts Down

TORONTO, CANADA, Aug. 16—The General Motors of Canada, Ltd., plant at Oshawa, Ont., near here, is being closed for a period of approximately six weeks to take the usual yearly inventory.

## Ohio Motorists Pay \$18,000,000 Gas Taxes

COLUMBUS, Aug. 16—Ohio motorists paid nearly \$18,000,000 in gasoline taxes in six months.

First half tax collections amounted to \$17,872,636.48, on 446,815,912 gallons. Total gallonage in the same period a year ago was 462,666,492, a drop of 15,850,580 gallons.

## Chevrolet Fleet Sales Show Increases

DETROIT, Aug. 16—Fleet sales of cars and trucks for commercial use by Chevrolet Motor Co. during the first six months of this year showed

an increase over the same period last year of 13.7 per cent, according to an announcement by H. J. Klingler, vice-president and general sales manager.

Included in the total are 4000 Chevrolet sixes sold to federal, state and municipal governments for various departments.

## Plymouth Increases Promotion

DETROIT, Aug. 17—Increased advertising in national magazines on the part of Plymouth is scheduled for the latter part of August and September, it is reported. The talking motion picture, "Behind the Scenes," is also being released to approximately 6000 motion picture theatres throughout the country at the expense of the factory.

## Wilcox Rich Corp. Reports Surplus

DETROIT, Aug. 17—Wilcox Rich Corp. reports for quarter ended June 30, surplus of \$10,284 after taxes and dividend requirements for class A shares. This compares with surplus of \$42,483 in preceding quarter and \$158,772 for the quarter ended June 30, 1931.

## Distribute Hupps

DETROIT, Aug. 17—Clark Cadillac Co. of Portland, Oregon; Packard Memphis Company, Inc., of Memphis, and Ralph W. Cook, Inc., of Philadelphia, have been appointed distributors for Hupmobile.

## Briggs Reports Net of \$347,960 for Quarter

Compares With Net Loss of \$1,000,000, Preceding Period

DETROIT, Aug. 17—Briggs Mfg. Co. reports for quarter ended June 30, net income of \$347,960, equal to 18 cents per share.

This compares with net loss of nearly \$1,000,000 in preceding quarter and net income of \$508,000 in second quarter last year.

The much improved showing for the second quarter was a reflection of increased activity on the part of Briggs' two major customers—Ford and Plymouth.

## F. W. Sinram

F. W. Sinram, president of Gears & Forgings, Inc., died August 2 in Cleveland. Elected the first president of the American Gear Manufacturers Association in 1917, he served continuously until 1923, when he was elected honorary president for life.

Mr. Sinram was a leader in laying out the program for the Gear Association, which included such important work as improvement in quality and standardization of gear design, manufacture and application. He assisted in the association's research work which has benefited the entire manufacturing world. Mr. Sinram was appointed chairman of the War Service Committee of the gear industry and started the work of gear standardization in accordance with Mr. Hoover's Gear Standardization Program.

## + + CALENDAR OF COMING EVENTS + +

### FOREIGN SHOWS

London, Olympia Show .....Oct. 13-22  
Glasgow, Scottish Motor Show...Nov. 11-19  
Paris, Aeronautical Show...Nov. 18-Dec. 4

### CONVENTIONS

American Chemical Society, Denver, Colo. ....Aug. 22-26  
S.A.E. Aircraft Meeting, Cleveland .....Aug. 30-Sept. 1  
American Society Mechanical Engineers, Cleveland, Ohio (Machine shop practice meeting) .....Sept. 12-17  
American Trade Association Executives, Atlantic City (Annual) .....Sept. 15-17  
Penna. Automotive Assn., Harrisburg, Pa. ....Sept. 19-20  
Natl. Assoc. of Motor Bus Operators, Chicago .....Sept. 22-23  
American Electric Railway Assn., Chicago, Ill. ....Sept. 27-28  
Amer. Institute Mining & Met. Engrs. (Petroleum Division), Dallas, Texas .....Sept. 30-Oct. 1  
S.A.E. Production Meeting, Buffalo .....Oct. 3  
Amer. Society for Steel Treating, Buffalo .....October 3  
Amer. Institute Mining & Met. Engrs. (Iron & Steel Division), Buffalo, N. Y. ....Oct. 3-6

National Safety Council, Washington, D. C. ....Oct. 3-7  
American Welding Society, Buffalo, N. Y. ....Oct. 3-7  
American Society Mechanical Engineers, Buffalo, N. Y. (Natl. Iron and Steel Meeting) .....Oct. 3-8  
S. A. E. Annual Transportation Meeting, Toronto .....Oct. 4-6  
American Gas Association, Atlantic City (Annual) .....Oct. 10-14  
Natl. Hardware Assn. (Accessories Branch), Atlantic City, N. J. ....Oct. 17-22  
Natl. Tire Dealers Assoc., Atlanta, Ga. ....Nov. 14-16  
American Society Mechanical Engineers, New York City (Annual Meeting) .....Dec. 5-9  
Natl. Exposition of Power & Mechanical Engineering, New York .....Dec. 5-10  
Highway & Building Congress, Detroit .....Jan. 16-23

### RACES

National Air Races, Cleveland .....Aug. 27-Sept. 5  
Altoona .....Sept. 5



# 3 BIG FEATURES TO LOOK FOR IN RIMS

— and only the Goodyear Type K gives them to you

## K-28

for 28° bevel mountings  
Sizes: 5", 6", 7", 8" and 9-10"



The man who changes tires doesn't have to fight with this rim.

THE BASE has a transverse split—a simple pry "shrinks" it so the tire can be lifted off.

THE RING is continuous, for strength and safety.

THE VALVE SLOT has an open end, which saves valves, makes handling the tube faster, safer.

Goodyear builds this rim for modern truck tires. It works equally well on any size truck—one-ton to five-ton and up. That's standardization.

For full data, write to Rim Department, The Goodyear Tire & Rubber Company, Inc., Akron, Ohio.

**TUNE IN:** Goodyear invites you to hear the Revelers Quartet, Goodyear Concert - Dance Orchestra and a feature guest artist every Wednesday night, over N.B.C. Red Network, WEA and Associated Stations

"THE MAN WHO CHANGES THE TIRES

LIKES K RIMS"

# GOODYEAR

K-28

RIMS

K-18

# NEW DEVELOPMENTS

## Automotive Parts, Accessories and Production Tools

### Porter-Cable Power Feed Double Belt Sander

Automatic sanding of wood or metal strip up to 1 in. thickness is facilitated by the new type DB double belt sander just announced by the Porter-Cable Machine Co., Syracuse, N. Y. It removes scale, burrs and produces a straight grain finish on one side or both.

The operation consists of feeding the work through by means of power feed rollers which give a uniform feed, the sanding being done between two large drive pulleys which are rubber-covered to give a cushion to the abrasive belts.

The abrasive belts run in opposite directions, thus neutralizing any motion that might be transmitted by the belt to the work.

A 1 or 1½ hp. motor is mounted on a hinge plate at back of machine. The motor pulley and drive pulley have two V-grooves, providing the abrasive belt with two different speeds. One V-belt drives both drum pulleys.

The drive to the feed rolls is by V-belt from ¼ hp. motor. This motor is also mounted on a hinge plate so that the V-belt can be easily changed from any of the three grooves to give the desired feed.

The bracket supporting the mechanism which controls the thickness of the work can be fastened on the pedestal in such a way as to take work from 0 to ½ in. or ½ in. to 1 in. as required, which should be specified on order.

The machine is 25 in. wide, 31 in. deep. Net weight, 700 lb.

### B & S Thickness Gages

Brown & Sharpe Mfg. Co., Providence, R. I., recently announced two new thickness gages, Nos. 645 and 647, with tapered blades 3 in. long and ¼ in. wide at the tip. No. 645 has nine blades varying in thickness from 0.0015 in. to 0.015 in.; No. 647 has 26 blades varying in thickness from 0.0015 in. to 0.0025 in. inclusive.

As an added feature both of these gages have blade locks, a device that makes it possible to clamp any desired blade or blades in position for use.

### American-LaFrance Announces New Fire Extinguishers

Two new fire extinguishers, the Foamite Crusader and the Childs Model DS, have just been announced by the American-LaFrance and Foamite Corp., Elmira, N. Y. Both are of the 2½-gal. size.

The principal feature is the "Mono-type" construction. The entire dome and shell is drawn from a single sheet of special alloy known as Alfronze—which the manufacturer claims is stronger and of higher ductility than copper and has special corrosion-resisting qualities.

The manufacturer states that under actual tests these extinguishers have an ultimate bursting pressure 30 per cent higher than ordinary fabricated extinguishers. Although these devices are stronger, the manufacturer has found that the charged extinguishers are 10 per cent lighter in weight than the ordinary type of machines.

### E-A Graphic Instruments

A complete line of graphic recording instruments by The Esterline-Angus Co., Indianapolis, Ind., is announced as having many new and improved features. For example, the spring clocks which drive the chart are made of removable units, escapement, spring barrel and gear train. These interchangeable clock units can be quickly dropped out and replaced in the field, without putting the instrument out of service.

Another innovation is that all three springs in the clock are wound at one time by means of a simple crank. This is done from the front of the meter, so that it is no longer necessary to space instruments apart on a switchboard in order to leave room for winding the clock.

The entire line comprises twenty-two different kinds of recording instruments, including A.C. and D.C. ammeters, A.C. and D.C. wattmeters, A.C. and D.C. voltmeters, Speed Recorders, Vacuum Recorders, High and Low Pressure Recorders, Frequency and Power Factor Recorders, Time and Production Recorders, Motion and Position Recorders, and Water Level Recorders.

A complete assortment of electrical synchronous motor clocks are also offered for driving the charts. Both these and the spring clocks give chart speeds ranging from ¼ in. per hour to 12 in. per minute.

### Haskelite Develops "Phemaloid" Lumber

Haskelite Mfg. Co. of Chicago has developed a new material of construction known as Phemaloid compound lumber. It comes in sheets or panels which are processed with a phenol-formaldehyde resin that renders it water-proof, fire-resistant and anti-septic. In the production of this compound lumber, successive layers of wood are placed on large trucks with the resin spread between adjacent layers. In addition there is a series of electrically-heated, polished plates interposed between the panels. The entire truck load is run into the press and pressure is applied by hydraulic rams. A temperature of over 300 deg. Fahr. is maintained for 15 minutes, during which time the resin and heat penetrate the wood, destroy all fungus growth, and fuse the different layers together.

The combination of high temperature and high pressure is said to produce a flat, smooth panel of uniform thickness, and as a rule no sanding of the faces of the panels is required.

After these panels come out of the press, they are trimmed by saws and are ready for shipment, unless the size is beyond 10 ft. x 10 ft. In case of longer panels, they are built up by scarfing together the 10 ft. x 10 ft. panels.

This compound lumber is said to be suitable for the construction of many airplane parts. In the automobile field it can be used for floors, instrument panels, tops, seats, bulkheads, running boards and door linings. There are particularly extensive possibilities in the application of the material in the construction of bus and truck bodies.

